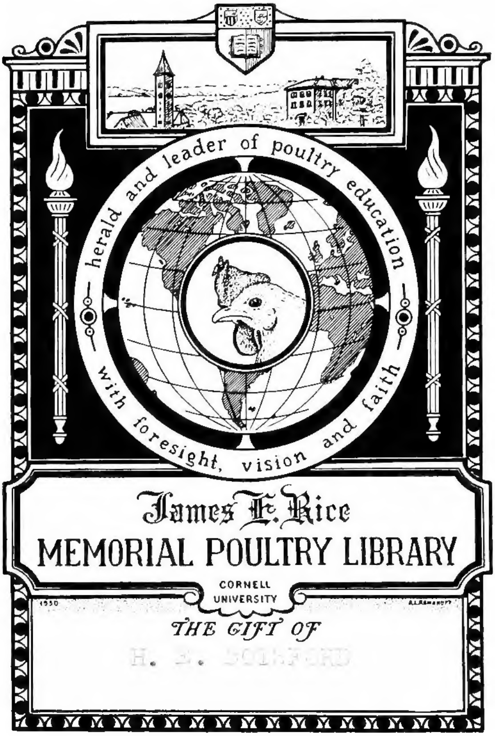
PRACTICAL POULTRY HUSBANDRY

BY

T. E. QUISENBERRY

THE
AMERICAN POULTRY SCHOOL
KANSAS CITY, MO.



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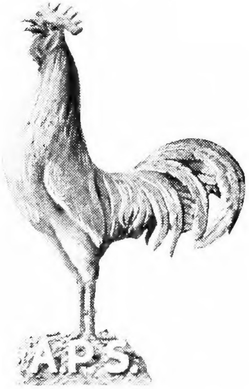

VOLUME III

ENEMIES AND PARASITES, DISEASES, MARKET EGG, MARKET POULTRY, CAPONS, TURKEYS AND WATERFOWLS, FITTING AND EXHIBITING, CLUBS AND ORGANIZATIONS, SUCCESS OR FAILURE.

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KANSAS CITY, MO.

ENEMIES AND PARASITES

By T. E. QUISENBERRY, President

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There are about thirty-one known species of insects that infest poultry. You should learn about the habits of the most common in order to know how best to combat them. Here is one place where eternal vigilance is required. Many poultrymen wreck their business by not being eternally vigilant in the fight to keep the fowls free from these enemies. Some stay on the birds continually, others find their way to the cracks of the houses and filth and there multiply in great numbers. Some harass the fowls by their claw-like feet as they crawl over them. Others suck their blood and some live upon the feathers of the birds.

A thorough study of the habits and prevention of the insect enemies of poultry is essential and your poultry education would certainly be one-sided if you failed to master the art of ridding the houses and poultry of the various insect pests that harass the birds and cut the profits by lessened egg production, slower growth and death losses. It is not essential that you should know the scientific names of all the various kinds, but you should learn how to distinguish one from another in order that you may better know how to combat them. It is also well to know something of the many animals and birds of prey that destroy them. The hawk will sometimes swoop down on the flock and is away with the chicken without the knowledge of anyone, or the domestic cat will make constant inroads upon the flock and the causes of decrease will hardly be realized until the loss is very great.

The strict scientific definition of the term would not include all of the creatures that we here include under the term insects, but in this discussion we shall use the term as it is popularly known—parasites.

PARASITES

A parasite is an insect that gets its existence by preying upon fowl or animal life for its sustenance. Animals both wild and domestic sometimes prove destructive to the existence of fowls, and losses often occur without the knowledge of the owner of the flock but the greater losses occur from absolutely preventable causes. Some of these parasites live over the winter by hiding under rocks, old lumber or other rubbish near the poultry house. Even though your house is entirely clean in the winter a few will return at the first approach of warm weather and as they multiply so rapidly, it is only a short time until you have a real problem in their eradication. Prevention is worth much and an early start to keep the house entirely clean is the best policy. Even the third generation will bring forth a hundred thousand or more parasites.

HOW FLOCKS ARE INFESTED

Even the introduction of one infested chick into a brooder full will soon have the lot infested. It takes but a very short time for the sitting hen to become fairly alive with insects, so much so that she is unable to incubate eggs and they sometimes die on the nests. Their vitality is so lowered by continual preying of the insects on the hen's body for their life sustenance that she will die unless she abandons the nest. This is one of the disadvantages of late hatching in many sections, as parasites multiply so much more rapidly in warm weather.

Filth itself does not produce parasites, but is conducive to increased production. The very conditions that are injurious to the birds are conducive to more rapid growth in numbers of parasites. Poorly ventilated, damp houses full of filth, will help them to multiply by millions.

They are sometimes introduced into the flock by the purchase of new birds. It would be well at certain seasons of the year, when you buy new birds, to quarantine them until they have had ample time to be freed from insects. Use the remedies that we give you and be sure that the quarters of the fowls are clean.

The chicks are infested by the insects from the hens when they are incubated by the natural method. By the time they emerge from the shell their battle for life against these pests begins. The insects will often be found clinging to the soft down and in a few days begin to get in their deadly work. The chicks should be well examined often to see that they are not infested with insects even though you have taken every precaution to keep the hens free.

The English sparrow is one of the main sources for the carrying of insects. You will almost always find their quarters alive with mites. It is well to try and keep them away on this account as well as on account of the fact that it takes much feed to keep them going.

THE INJURY CAUSED BY PARASITES

A large proportion of the deaths of poultry can be attributed either directly or indirectly to parasites. By lowering vitality they render the birds fit subjects for all kinds of diseases. Though they do not always kill outright, they are a contributing cause. By their continual irritation they disturb digestion, poor assimilation follows and the birds are rendered unfit to withstand any kind of disease which may attack them. The hens need all of the surplus food not used in body maintenance for the making of eggs. To supply the insects with their portion of blood keeps them busy for they are sure of their toll.

They interfere with the hens in natural methods of incubation and greatly lessen the chances for success in rearing the stock as it is impossible for the hen to keep on the nest when she is covered with insects. She furnishes ideal conditions for their reproduction and very soon there are so many that she cannot perform her duty.

These insects are in some cases disease carriers and can carry spores of some diseases from one fowl to the other. They often render birds unsightly and unfit them for the show room.

SPRAYING WILL ABSOLUTELY PREVENT LOSS

The destruction of the insect enemies of poultry is not such a big job if the work is undertaken in time. It is just like many other details connected with the work, you cannot afford to put off. Spraying the house occasionally and keeping it clean is not a difficult task and will save many death losses. Millions of chicks are lost each season because of lack of forethought and just a very small expense and a little time. Keep a watchful eye on the hens and be sure that you detect in time the fact that they need attention. A hen infested with insects is too miserable to give a good account of herself in egg production and it matters not even if you give her a balanced ration and her breeding is the finest, she will not yield a profit. When the chicks begin to come off, they are doomed to an early death for the insects quickly make their way to them and as they have not the resisting power of the older stock, few survive. Profits can be wiped away in a short time. We urge you to keep the houses clean and well sprayed. A spray pump is a necessary appliance on every farm of any size. If the houses are sprayed each Spring and Fall and every month or six weeks during the summer and the solutions are used which we recommend later in this lesson, they will absolutely protect your poultry against mites, lice and scaly leg.

EFFECT OF DOMESTICATION

In their native state the birds were better equipped to care for themselves. They had the jungles in which they could hide themselves from the enemy. Their power of flight was better and nature colored their plumage to help them in their escape from the enemy. The environment was not conducive to insect growth. Now, when we house them for protection from the winter winds we add new problems, for we make the condition favorable to the multiplication of the various insect pests. We have lessened the enemies of the forest to some extent by domestication, and as the forests gradually disappear the problem of protection from many enemies common in the early days of the industry is growing easier each year.

Death losses are greater when the chicks are young, but the evils of parasites and insects are not to be measured in the toll that death takes, for there are so many other ways in which losses occur. A mite and louse infested hen cannot be happy or contented when she is annoyed at night by the pestiferous mite drawing her life blood for its maintenance and then hiding away in some cozy crack in the house during the day; then when she starts her morning task to have the lice with their rasping feet making their way from one part of her body to the other hunting their daily ration. It is true that they live much on the waste material from the skin and feathers, but they keep the hen annoyed by crawling over the body. One of the underlying principles of large egg production is contentment, and this you can never have when the flock is infested with insect pests.

SPRING SEASON FOR REPRODUCTION

Abundant reproductive capacity is one of Nature's ways of helping fowl life to survive. The hen can reproduce herself many times and by proper care we can profit by Nature's laws, for this loss of life can be reduced to a minimum with proper precaution. Millions of chicks are lost each year by the insect route.

Spring and summer are the natural seasons for insect as well as poultry reproduction and when there should be the greatest freedom from insects we have them in largest numbers. The ground begins to warm and they make their way from the various hiding places that they have had for the winter to find their prey. Even though your hen house is new and free from mites it will not be long until it is filled, if a few get in and begin to breed. Then the birds of prey have a duty to perform in the rearing of their own young and they forage with diligence to feed themselves and their offspring. Sometimes one hawk will kill as many as forty or fifty chickens in a season. In the spring the birds are less protected than at any other season of the year and at this time are in the greatest danger.

POULTRY ENEMIES.

RATS.

Of those creatures that prey upon chicks and eat them, we put rats at the head of the list in destructiveness. The rat is a universal nuisance and works injury to the town lot poultryman as well as to the farmer who lives far from the city or village. They will not only eat the bird, but they will live upon the same kind of food. He is carniverous and graniverous and works destruction in two ways. They can be very destructive and eat much of the food intended for the fowls. It takes a lot of grain or many young chicks to aid the rat in rearing a family. They kill the young chicks when the opportunity is presented.

Rats are resourceful in their hiding places and they have the habit of getting in the most inaccessible place. A poultry house with the floor near the ground affords a very convenient place for them. The wood pile near the poultry house affords a fine protection and from here they venture forth at night, either to eat your feed from the hopper or break in upon the unprotected chicks. The barn near by, filled with hay and grain, harbor many unless precaution has been taken to make the building rat proof. They hide themselves under the hay stack,rock piles, ricks of wood or any rubbish that happens to be piled about the place.

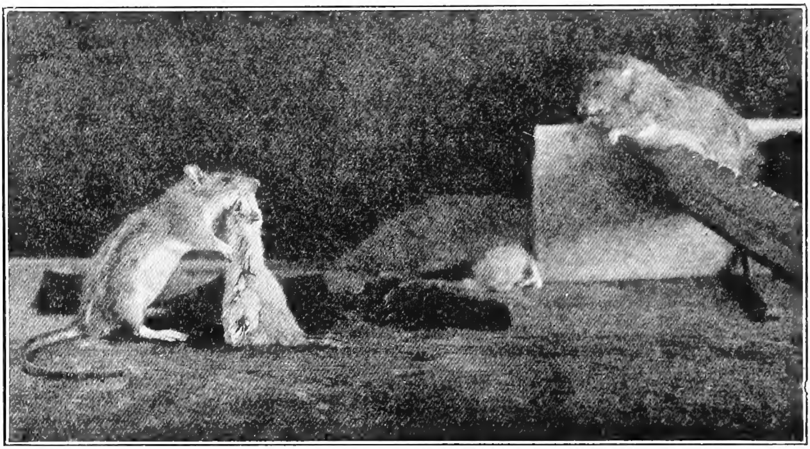
One method that has been suggested is to fill the runs with concentrated lye. They get it on their feet which eats them to such an extent as to kill the rats. Traps are very good and you can catch many in them, but each time any are caught the trap must be thoroughly scalded or the rats will keep away from it.

The most effective way is to introduce rat killing day when all hands will get on the job, accompanied by a good rat dog, borrowed from the neighbor, if you have none; then the neighboring boys, who are always eager for a chase, can be called in and will oftentimes render effective service and really enjoy the fun. This should also be clean-up day to carry away rubbish and destroy all possibility of their having a place to harbor.

If you have a pile of brush, straw or rubbish which is acting as a protection and harbor for rats it is a good idea to build a small wire or board enclosure around the pile before putting your dogs in or attempting to kill the rats. The rubbish and brush may then be thrown out, and the rats will be surprised by the wire or board enclosure which aids the dogs, boys and men armed with sticks to kill all rats before they can escape. Hundreds have been known to be killed in a single day in this way. Other animals used in the destruction of rats are cats and ferrets.

The cat is often recommended but its ways are treacherous and often when one gets to taking chickens it will destroy them in great numbers. The use of the cat is a doubtful policy. The rat dog of the living creatures is more trustworthy.

Every poultryman should guard against allowing stacks and piles of trash, lumber and rubbish to accumulate and become a harbor and breeding place for these pests.



There is no more vicious enemy to poultry than rats.

RATS EASIER KILLED IN WINTER

Winter is a better time to kill rats than during the summer. Feed is scarcer in winter and the rodents are therefore hungry and thirsty and more easily tempted by poisoned food.

Good terriers keep rats on the move and catch them when driven from burrows. If there is an old pile of brush, rats can be fed there, then gradually killed as the brush is removed. Failing to have a couple of good dogs for this purpose, clubs can be used. Surrounding the pile with wire netting will make sure of all the occupants.

Where nothing is done, rats increase and multiply to make things a misery while the results of an active campaign cannot merely be measured by the number of rats killed, but by the fact that a good many will seek other quarters.

SWEEP UP ALL SPILLED GRAIN

Where little stock is fed starvation drives away rats. Sweeping up all spilled grain and feeding it to the hogs or chickens is useful and the presence of a good terrier keeps rats from becoming overbold at feeding time. I like to keep some traps around all the time, sometimes baiting them. When unset, the rats become careless and when they are again set a lot will be caught. A pan of meal set out for a few days will bring rats to feed there.

Later Paris green can be mixed with it, killing a lot of rats. It does not always pay to entirely exclude rats from a tight granary, for there they may be safely poisoned with juicy fruity baits or the holes by which they pass may be suddenly stopped and a number killed.

Various poisons are used for killing both rats and mice and, if used with judgment, the chances of the other animals getting the poison are not very great. Those most commonly used are strychnine, phosphorus, squills and so on.

Some very good patent poisons are on the market. In many cases the use of a little syrup made from brown sugar and water, dropped on the bait, will make rats attack it greedily, as they are very fond of sweets.

STRYCHNINE ON LARDED BREAD

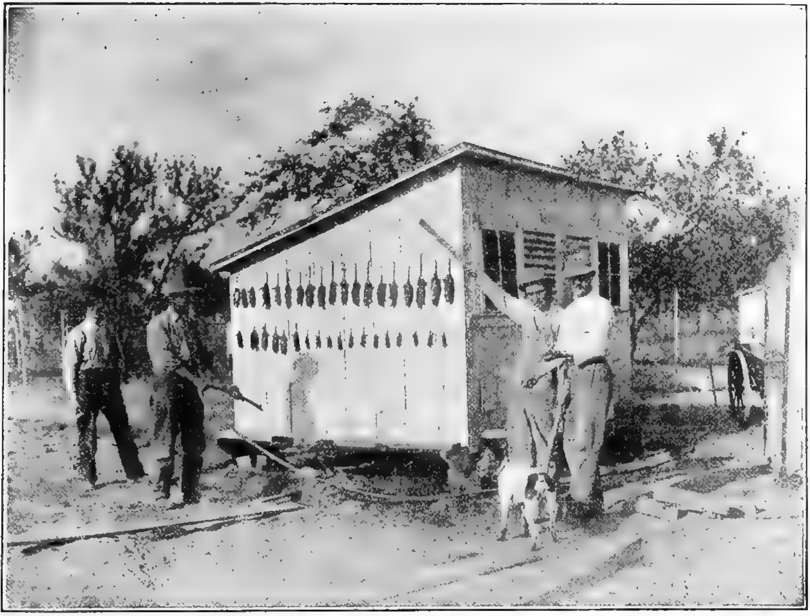
One farmer reports good success with pieces of bread spread with lard and cut into half-inch squares, on each of which was placed about one-sixth of a grain of powdered strychnine. This was then covered with a little brown sugar syrup and dropped into the holes.

Strychnine is, of course, a deadly poison, and all rats which can be found should be burned. Its bitter taste also works against its success, and for these reasons it is not used so much as some of the less dangerous ones. Another farmer recommends mixing strychnine and molasses, spreading it over bread and dropping small squares into the holes. Still another recommends mixing thoroughly equal parts concentrated lye and molasses, putting a little brown sugar syrup over the top, and setting it where the rats can get to it. This is like phosphorus, in that it drives the rat forth to hunt water, and he will not likely die in the building.

RAT-PROOF BUILDINGS

One of the first and most important measures for rat repression is to provide rat-proof buildings. Exclude them from any place where they can find food or a place of safety in which to rear their young.

All of your buildings should be so constructed that rats cannot hide themselves under them. Concrete foundations are a great help and if you do not



A good day's catch.

use concrete, dig a trench a foot wide, a foot deep and use one-inch mesh wire. It should extend to the bottom of the inside of the trench and be turned out for a little ways at the bottom. Then fill in the trench with dirt. The rat will burrow down the wire until he strikes the bottom but will not go out over the edge to make its way under.

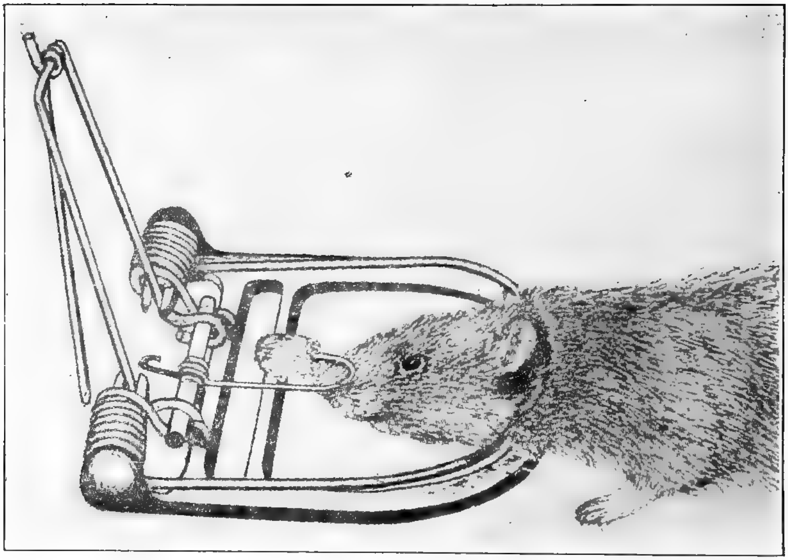
Build your houses at least a foot from the ground so the rats will not have a hiding place.

The U. S. Government, through the Bureau of Biological Survey, Department of Agriculture, recently sent out information concerning the trapping and poisoning of rats which I regard as so valuable that I repeat it here together with the illustrations which they give:

TRAPS FOR DESTROYING RATS

Owing to their cleverness it is not always easy to clear rats from premises by trapping; if food is abundant, it is impossible. A few adults refuse to enter the most innocent looking trap. And yet trapping, if persistently followed, is one of the most effective ways of destroying the animals.

Guillotine Trap.—For general use the improved modern traps with a wire fall released by a baited trigger and driven by a coiled spring have marked advantages over the old forms, and many of them may be used at the same time. These traps, sometimes called "guillotine" traps, are of many designs, but the more simply constructed are preferable. Probably those made entirely of metal are the best, as they are more durable. Traps with tin or sheet-metal bases are not recommended.



Method of baiting guillotine trap.

Guillotine traps of the type shown should be baited with small pieces of Vienna sausage (Wienerwurst) or fried bacon. A small section of an ear of corn is an excellent bait if other grain is not present. The trigger wire should be bent inward to bring the bait into proper position for the fall to strike the rat in the neck, as shown.

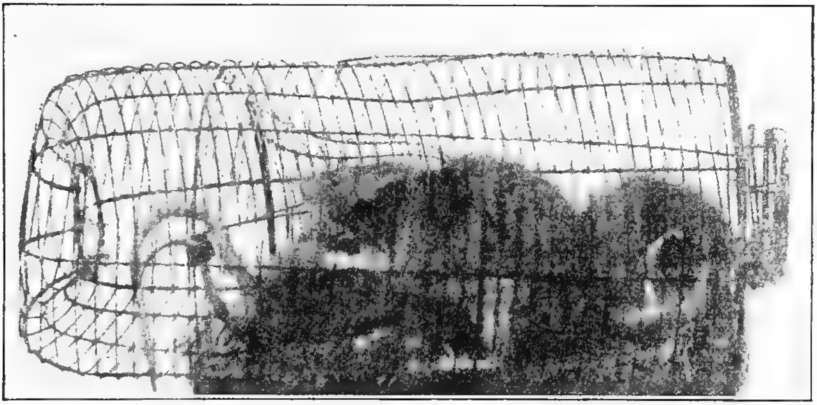
Other excellent baits for rats and mice are oatmeal, toasted cheese, toasted bread (buttered), fish, fish offal, fresh liver, raw meat, pine nuts, apples, carrots, and corn, and sunflower, squash, or pumpkin seeds. Broken fresh eggs are good bait at all seasons, and ripe tomatoes, green cucumbers, and other fresh vegetables are very tempting to the animals in winter. When seed, grain or meal is used with a guillotine trap, it is put on the trigger plate, or the trigger wire may be bent outward and the bait placed directly under it.

Oatmeal (rolled oats) is recommended as a bait for guillotine traps made with wooden base and trigger plate. These traps are especially convenient to use on ledges or other narrow rat runs or at the opening of rat burrows. They are often used without bait.

A common mistake in trapping for rats and mice is to use only one or two traps when dozens are needed. For a large establishment hundreds of traps may be used to advantage, and a dozen is none too many for an ordinary barn or dwelling infested with rats. House mice are less suspicious than rats and are much more easily trapped.

Cage Trap.—When rats are abundant the large French wire cage traps may be used to advantage. They should be made of stiff wire, well reinforced. Many of those sold in stores are useless, because a full grown rat can bend the light wires apart and so escape.

Cage traps may be baited and left open for several nights until the rats are accustomed to enter them to obtain food. They should then be closed and freshly baited, when a larger catch may be expected, especially of young rats. As many as 25, and even more, partly grown rats have been taken at a time in one of these traps. It is better to cover the trap than to leave it exposed. A short board should be laid on the trap and an old cloth or bag or a bunch of hay or straw thrown carelessly over the top. Often the trap may be placed with the entrance opposite a rat hole and fitting it so closely that rats cannot pass through without entering the trap. If a single rat is caught it may be left in the trap as a decoy to others.



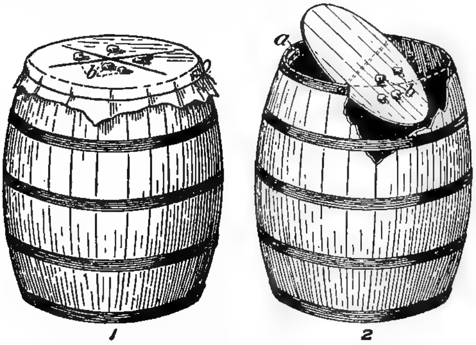


Fig. 9.

Barrel Trap.—About 60 years ago a writer in the Cornhill Magazine gave details of a trap, by means of which it was claimed that 3,000 rats were caught in a warehouse in a single night. The plan involved tolling the rats to the place and feeding them for several nights on the tops of barrels covered with coarse brown paper. Afterwards a cross was cut in the paper, so that the rats fell into the barrel (Figure 9, (1)). Many variations of the plan, but few improvements upon it, have been suggested by agricultural writers since that time. Reports are frequently made of large catches of rats by means of a barrel fitted with a light cover of wood, hinged on a rod so as to turn with the weight of a rat. (Figure 9, (2).)

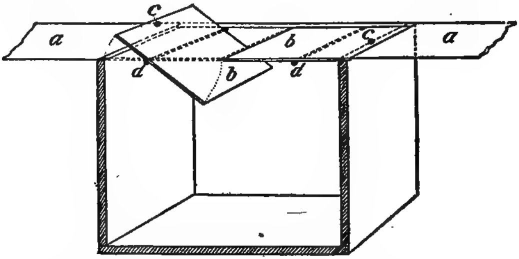


Fig. 10.

Pit Trap.—A modification of the barrel is the pit trap (Figure 10). This consists of a stout narrow box sunk in the ground so that the top is level with the rat run. It is fixed with a cover of light wood or metal in two sections, the sections fitting nicely inside the box and working independently. They turn on rods to which they are fastened. They are weighted near the ends of the box and so adjusted that they swing easily. An animal stepping upon the cover beyond the rods is precipitated into the box, while the cover immediately swings back to its place. Besides rats, the trap is well adopted to capture larger animals, as minks, raccoons, opossums and cats. It is especially useful to protect poultry yards, game preserves and the like. The trap should be placed along the fence outside the yard and behind a shelter of boards or brush that leans against the fence.

Steel Traps.—The ordinary steel trap (No. 0 or 1) may sometimes be satisfactorily employed to capture a rat. The animal is usually caught by the foot, and its squealing has a tendency to frighten other rats. The trap may be set in a shallow pan or box covered with bran or oats, care being taken to have the space under the trigger pan free of grain. This may be done by placing a very little cotton under the trigger and setting as lightly as possible. In a narrow run or at the mouth of a burrow, steel trap unbaited and covered with very light cloth or tissue paper is often effective.

The best bait usually is food of a kind that rats and mice do not get in the vicinity. In a meat market, vegetables or grain should be used; in a feed store, meat. As far as possible, food other than the bait should be inaccessible while trapping is in progress. The bait should be kept fresh and attractive and the kind changed when necessary. Baits and traps should be handled as little as possible.

POISON

While the use of poison is the best and quickest way to get rid of rats and mice, the odor from the dead animals makes the method impracticable in occupied houses. Poisons may be effectively used in barns, stables, sheds, cribs and other outbuildings.

Poison for rats should never be placed in open or unsheltered places. This applies particularly to strychnine or arsenic on meat. *Packages containing poisons should always bear a warning label and should not be kept where children might reach them.*

Among the principal poisons that have been recommended for killing rats and mice are barium carbonate, strychnine, arsenic, phosphorus and squills.

BARIUM CARBONATE

We have had better success with this than with any other method of exterminating rats. It has proven effective with us when everything else has failed. Barium carbonate is one of the cheapest and most effective poisons for rats and mice. This mineral has the advantage of being without taste or smell. It has a corrosive action on the mucous lining of the stomach and is dangerous to large animals if taken in sufficient quantity. In the small doses fed to rats and mice it would be harmless to domestic animals. Its action upon rats is slow, and if exit is possible the animals usually leave the premises in search of water. For this reason the poison may frequently, though not always, be used in houses without disagreeable consequences.

Barium carbonate may be fed in the form of dough composed of four parts of meal or flour and one part of the mineral. A more convenient bait is ordinary oatmeal with about one-eighth of its bulk of the mineral, mixed with water into a stiff dough. A third plan is to spread the barium carbonate upon fish, toasted bread (moistened), or ordinary bread and butter. One of the best things to mix the barium carbonate with is Hamburger steak or ground-up lean meat. Use about a teaspoonful of the barium carbonate to a pound of the meat. The prepared bait should be placed in rat runs and holes and about the building, about a teaspoonful at a place. If a single application of the poison fails to kill or drive away all rats from the premises, it should be repeated with a change of bait. Keep away from cats, dogs, pets and children.

STRYCHNINE.—Strychnine is too rapid in action to make its use for rats desirable in houses, but elsewhere it may be employed effectively. Strychnine sulphate is the best form to use. The dry crystals may be inserted in small pieces of raw meat, Vienna sausage, or toasted cheese, and these placed in rat runs or burrows; or oatmeal may be moistened with a strychnine syrup and small quantities laid in the same way.

Strychnine syrup is prepared as follops: Dissolve a half ounce of strychnia sulphate in a pint of boiling water; add a pint of thick sugar syrup and stir thoroughly. A small quantity may be prepared with a proportional quantity of water and syrup. In preparing the bait it is necessary to moisten all the oatmeal with the syrup. Wheat and corn are excellent alternative baits. The grain should be soaked overnight in the strychnine syrup.

ARSENIC.—Arsenic is probably the most popular of the rat poisons, owing to its cheapness, yet our experiments prove that, measured by the results obtained, arsenic is dearer than strychnine. Besides, arsenic is extremely variable in its effects upon rats, and if the animal survives a first dose it is very difficult to induce it to take another.

Powdered white arsenic (arsenious acid) may be fed to rats in almost any of the baits mentioned under barium carbonate and strychnine. It has been used successfully when rubbed into fresh fish or spread on buttered toast. Another method is to mix twelve parts by weight of corn meal and one part of arsenic with whites of eggs into a stiff dough.

An old formula for poisoning rats and mice with arsenic is the following, adapted from an English source:

Take a pound of oatmeal, a pound of coarse brown sugar and a spoonful of arsenic. Mix well together and put the composition into an earthen jar. Put a tablespoonful at a place in runs frequented by rats.

Poison in Poultry Houses.—For poisoning rats in buildings and yards occupied by poultry the following method is recommended: Two wooden boxes should be used, one considerably larger than the other and each having one or more holes in the sides large enough to admit rats. The poisoned bait should be placed on the bottom and near the middle of the smaller box and the larger box should then be inverted over it. Rats thus have free access to the bait, but fowls are excluded.

One authority recommended the following as an exterminator of rats and mice:

Purchase of your druggist 10 cents' worth of "Oleum Menthes Pip." Apply this to wads of cotton and introduce into the haunts of rats and mice. It will drive them away at once. Perhaps they may be persistent and attempt to return; if so, repeat the process, saturating the wads daily until a permanent exodus has become evident. The liquid is non-poisonous to mankind.

RAT VIRUS

A good many remedy companies manufacture and sell rat virus. Many make extravagant claims for their product. We have found in some cases that it affects the rats and in large numbers of cases it has no effect on them at all. One trouble with this product is the fact that it will not keep for any great length of time and is affected by weather conditions. This virus is supposed to produce a deadly disease among rats and it spreads from one to another.

An important characteristic of this virus is the fact that rats and mice infected with the disease it produces almost invariably seek the open air to die. Thus the nuisance of dead rats about the buildings, under floors, in walls, etc., is practically eliminated.

It is a well known fact that rats are cannibalistic in their habits. Those that first succumb to this virus being weak from disease are attacked by their fellows and devoured. In this manner the disease is transmitted from one to another. Never kill a rat that is sick or "dopey" from a virus; he is bait for others.

In the use of any vaccine, virus, antitoxin or serum, etc., whether for the inoculation of disease or to induce immunity against disease, there is always a condition present in the patient that must be taken into consideration, viz., susceptibility. That is, how will the patient accept the product?

Every human being or animal has some natural resistance against disease. In some cases the natural resistance may be sufficient to prevent disease by inoculation. In most cases it will not do so.

The many kinds of rat virus which are made and sold are supposed to produce a disease peculiar to rats and mice. In a majority of cases, inoculation will produce this disease and consequently destroy the pests, but many times there will be found individuals or colonies of rats that are immune to this disease, and upon which it apparently has no effect. Therefore, it often fails to destroy them. This virus is not a poison.

The use of virulent poisons for killing rats and mice is a serious matter; in fact, many disastrous accidents to human beings are chargeable to this practice. There is always grave danger in the use of arsenic, strychnine, phosphorus and other powerful poisons. Rat virus is not a poison. One of its most distinctive and valuable features is that it apparently does not affect animals other than rats, mice and field mice. In other words, tests have been made on horses, cattle, sheep, dogs, cats, poultry, etc., and even other members of the rodent family, including rabbits, ground squirrels, gophers, prairie dogs, etc., which have shown they are immune to the disease.

On account of the many failures experienced with different makes of rat virus, we recommend the barium carbonate treatment as being much better and far more certain than any other rat exterminator we have ever used.

SKUNKS

Skunks are destructive only to young chicks, but if they get very hungry and do not find just what they most desire they will take eggs. They are night workers, as are the rats, but they do not hide the young chicken as does the rat, but they take some home for the young. In their breeding season they are more diligent than at other times.

They usually make their dens in the ground under rocks, under hay, straw stacks, or about some building. They are more easily trapped than rats. The use of the common steel trap is very effective. The trap must be placed at the entrance of their den. If you cannot locate the hiding place of the skunk, use an ordinary rabbit trap baited with a dead chicken. Place it where the skunk is accustomed to making visits. Some claim that they do more good than harm by catching mice about the barn and ground mice in the field.

The best policy is to try and render the young stock safe from these enemies that make their raids at night. It does not require much labor to so construct your coops to render them safe from the enemies we have named. The chicks are worth too much to risk to so much exposure when a little time and a small expense will render them quite safe.

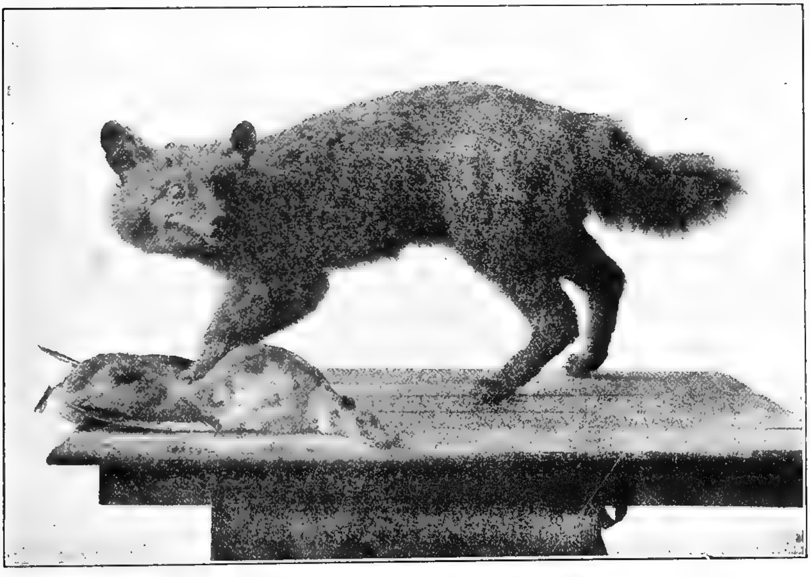
The skunk often makes inroads upon the fowls.

OPOSSUM

The opossum enters the roost at night and takes the fowls. As we mention one enemy after the other you can readily see the necessity of proper housing. The opossum is awkward in the handling of the fowls and will grab them anywhere he can. This fact helps you in offering aid as the whole flock is aroused and you have time to save the bird.

He makes his home in holes in the ground, hollow logs or trees. The opossum offers good sport in the hunting season, and the man with a good hound dog will help you to keep him in control. A dog about the premises will render service in keeping the opossums away. The old opossum takes the young with her in her raids on the poultry house which renders it easy to destroy the whole family in mighty short order.

In the chase the opossum does not last long when the dog is in pursuit for he soon takes to a tree and it is easy to bring him down.



In most communities the fox is not much longer a problem to the farmer.

FOXES

In many sections the foxes are no longer a menace. In England they present a serious problem, for many of the English sportsmen own large estates and care more for this chase than they do for the safety of the farm flock and they protect them in order to have amusement by running them with their fox dogs.

They have been hunted so much in this country that they are rather timid and it is not often that they make their way to the poultry house. They are shy and timid and avoid the trap. You can use their suspicious nature to advantage by hanging an obstruction in the exit of the poultry house. A chain, wires or bottles will answer the purpose. He fears a trap and will not venture in.

THE WOLF

The wolf is one of the vanishing creatures of the plain and forest and offers a very small problem in the major portion of the U. S. He soon becomes the victim of the hunter and it is not likely that any of our students will build poultry yards that are accessible to these creatures of the wilds.

SNAPPING TURTLES

The turtles are enemies to water fowls and are especially destructive to young stock. They catch them while they are swimming in the water and drag them under and destroy them. The only way we can suggest to you is to shoot them while they are basking in the sun. However, if they are very troublesome you can better afford to keep the young stock away from the streams than you can spend time trying to destroy the turtles.

Turtles often kill or cripple a great many ducks. If the water is shallow and the stream is narrow, the turtles can often be raked out with an ordinary garden rake. If they cannot be eliminated in this manner the water should be dragged.

BLACK SNAKES

The black snakes will eat many eggs and whole broods of chicks if they are not destroyed. They do not eat so often but will prove very destructive. They live around the barns in the hay or under timbers that are lying around. Your rat killing crusade should unearth the snakes. If they give you much trouble it will pay you to lie in wait for them. Shoot them or kill them in some other manner.

HAWKS

Hawks are one of the worst enemies with which the farm poultryman, especially, has to deal. They are rapid in their movements and when they locate a flock of young chicks they swoop down on them and are away in an instant. When you are keeping your young stock on range where there are many trees, the hawk is offered an especially good opportunity for his work. There are several hundred varieties of hawks and some are more troublsome to the poultryman than others. It is often claimed that certain varieties of hawks do the farmer much good in killing field mice which are destructive to crops. The small sparrow hawk is not so destructive but if the chicks are in a very convenient place and other food cannot be found they will take the young birds.

The large chicken hawk is the most destructive and can carry away half grown fowls. The hen will fight for her young but cannot always save them. She merely offers the cry of alarm and helps the chicks to hide. The hawk is the stronger of the two and can vanquish the hen in a contest.

The hawk gets in his work during the day and it is thought that he is rather regular in his raids, which offers opportunity to lie in wait for him with a shot gun.

The hawk picks up the chicks with its strong talons as he makes this sudden dart to the earth. In destroying larger birds the hawk knocks the victim to the ground and if too large to carry away will eat it where the bird is killed. If disturbed the hawk will fly a short distance and light and when you are away will return to finish the meal.

Traps can be set on top of tall posts which will sometimes catch the hawk. Many of them are killed with the gun.

The blue darter hawk which proves troublesome.

At the Maine Experiment Station the chickens are confined to a certain section of the farm. Wires are strung on high poles over the yard in which the chickens are confined. These wires are the support for hundreds of strands of cord or binder twine which forms a perfect net work. Where this method is used, the chickens have to be confined to not more than two or three acres of ground or just enough so that you can cover it with the wire and twine. The poles are just high enough so that they will hold the wire sufficiently high so that a man can walk about underneath the twine strings without interferring with his head. The poles are placed just close enough so as to prevent the wire from sagging. The wire runs from pole to pole from one side of the yard to the other. Then the binder twine is strung across the top of the wires and run in the opposite direction from the wires. Remember that the wire and poles are about 12 to 24 feet apart, being just close enough to support the binder twine. The twine string is strung about 9 to 12 inches apart. The hawks and crows get the impression that it is a trap set for them. The Maine Station found this method very effective in protecting the young stock from both hawks and crows.

We have often had the question asked us, "Would nux vomica fed to young chickens kill the hawks." We believe that this is used to advantage in some cases and is recommended by some experiment stations. We were much interested recently in a letter from a gentleman in Missouri who has been making a special study of the problem of eliminating the hawk. He states that the hawk, like all birds that do not have crops, are especially susceptible to strychnine poison. He recommends that small quantities be rubbed on the heads of the chickens by putting a little strychnine in lard. If only one chick would have to be sacrificed to get the hawk it would be small for his destruction.

OWLS

The owl is a night prowler and preys upon the birds while the owner is asleep. The only two varieties that need be mentioned are the Screech Owl and the Great Horned Owl. The Screech Owl is noted for the weird noise that it makes and is not as troublesome, as its chief food is mice. The great Horned Owl is the greatest enemy of the owl family to the barnyard flock. It proves a nuisance to the type of poultryman who does not have a house for the birds but allows them to roost in trees. They are accustomed to striking the bird from their roosting place and knocking it to the ground. In this way the bird is stunned and is easy to catch and kill.

Great Horned Owl that is with us the year round.

A tall stake with a steel trap set on top of it and placed in the yard near the roosting place of the fowls is a good method of catching the owl.

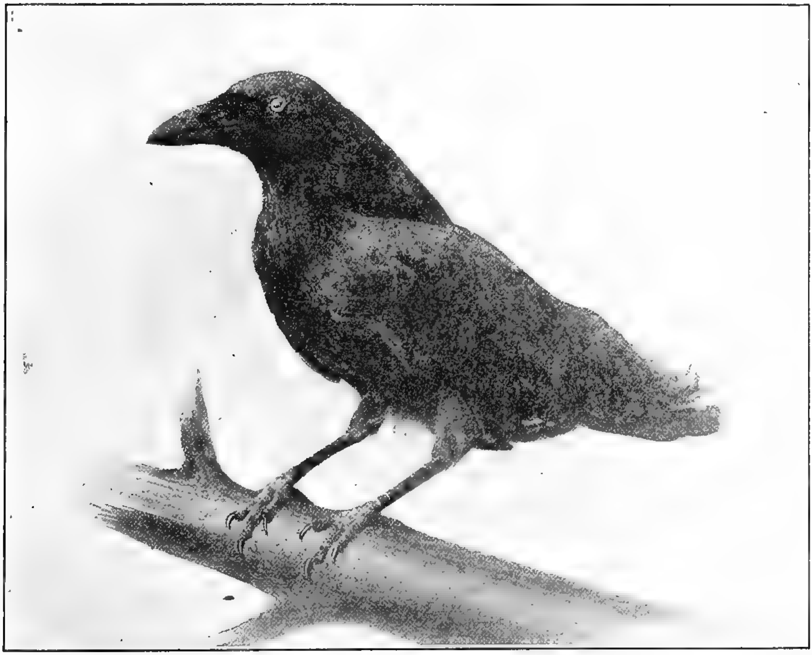
The owl remains throughout the winter and spends much of its time hunting for field mice and many enemies of the field and orchard crops. Their favorite time is just at twilight and before dawn. If they can find an abundance of food in the fields they are not so apt to visit the domestic fowls. If you house the fowls, there need not be much fear from being molested by owls. The hawks during the winter season hunt a mild climate, migrating as do most of the birds, whereas, the owl remains throughout the winter season. Often the hunter has opportunity to kill owls in the woods as they sometimes venture from their living places in the day time.

CROWS

Crows are a menace to the young chicks and will eat eggs. If not interferred with, they will often destroy a whole brood in a day. They are shy birds, but if they get busy on the job of destruction you can more likely kill them. They will, most of the time, keep far beyond the range of the gun. Some have thought that they were observant enough to note the cackle of the hen and go get the eggs as they are laid. They have also been seen to follow the turkey to her nest, perch in a tree near by until the egg is laid, then go and eat it.

It is during the spring time that the crow proves most troublesome, at the time they are nesting. During this time they are especially alert, and while one is away foraging for food another remains by the nest for the protection of the young. They sometimes work in trios and when danger approaches the watchman gives the alarm to those away on their food gathering task. Their nests are usually high above the ground in a well-protected spot.

The common scarecrow sometimes will prove effective in driving away the crows. One of the most effective ways to eliminate them is to take an egg, puncture it and put a dose of strychnine in it and stir the contents of the egg well. Place it on top of the fence posts or on a high post for the purpose and out of reach of the stock. They are accustomed to lighting on spots near together. One will light on a post to act as sentinel while the other will do the foraging. If the bird that lights on the post finds the poisoned egg, it eats it and disappears.



The crow is timid and preys upon the birds that wander far from home.

CATS

Next to the rat, the cat is the most destructive enemy with which poultrymen have to contend. The cat is so often a trusted member of the household on whom we are not so likely to cast suspicion. It will often abuse this confidence and make a constant inroad upon a bunch of young chicks each day until the flock disappears. The cat is as sly about catching the chicks as it is in catching mice or rats. It will often hide in the grass and lie in wait for the mother hen to come its way and will often get the whole flock before the owner realizes what has destroyed them. A well fed cat is not so likely to eat chickens, and the dead chicks should not be permitted to be left lying around for it to eat.

The domestic cat can soon destroy a brood of chicks.

When it is caught taking chicks, you had just as well dispense with the cat either by shooting or by giving it strychnine.

DOGS

Even the faithful dog sometimes proves an enemy.

Dogs sometimes prove to be very troublesome, especially in destroying eggs, although they will occasionally destroy the young chicks. This habit is more especially confined to the bird dog and young pups. Often times the hunting hound or your neighbor's worthless cur will get the habit of raiding the nests for eggs. The shot gun is the best method of stopping the work. It is possible to put in drugs that will be nauseating to the dogs, but they will generally destroy more eggs and chickens than they are worth. Kill such dogs or give them to some friend who does not raise poultry, or else confine the dogs.

HENS AND OTHER POULTRY KILL CHICKS

Sometimes other birds such at turkeys, guinea fowls or peacocks will destroy the young and even the mother hen will kill chickens that she does not think are her own or one that happens to be a different color from the majority of the brood. A separate place should be used for the chicks in order to keep the young away from the older stock, not only on account of many being killed, but from the fact they contract various troubles from the older stock. Keep guineas, peacocks and water fowls away from your chicks, and if the mother hen attempts to kill them, separate the hen and the chicks and also dull her beak by cutting off the point of both upper and lower portions until you cut it to the quick.

WEASELS

These sometimes kill great numbers of young chickens. The young stock should not be brooded on a piece of land that shows signs of harboring a lot of poultry enemies of this kind. Set steel traps in the runways where you think they are harboring or frequently pass.

The weasel is a sly enemy of poultry and difficult to kill.

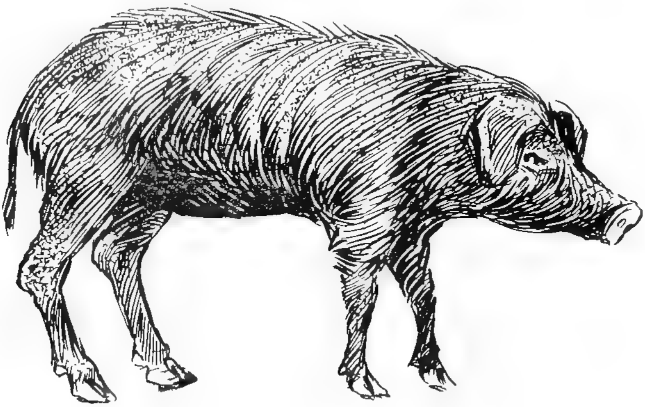
A poultryman writes as follows, regarding his experience with weasels:

"Out of a flock of 250 Barred Rock chicks in a colony house we had 117 killed by a weasel in one night. The chicks were dragged through a small hole in the floor and stacked up in piles beneath the house. We raised the colony houses on drainage tile a foot in diameter, so that the houses were two feet from the ground. The smooth tile prevented weasels from climbing up to the floor, and we have never lost a chick from weasels since that night.

"The weasels will occasionally attack old hens. A neighbor found a weasel holding a half-grown Barred Rock pullet in her orchard, and as the animal showed no signs of fear she stepped on it and killed it. We have found that the only way of fighting weasels is to clean up their breeding places. The pests are very difficult to catch in traps. They breed in stone piles, scrap-lumber piles, and old stumps, and will raise as many as five young in a litter. Removing the breeding places will assist in driving them from a farm.

HOGS

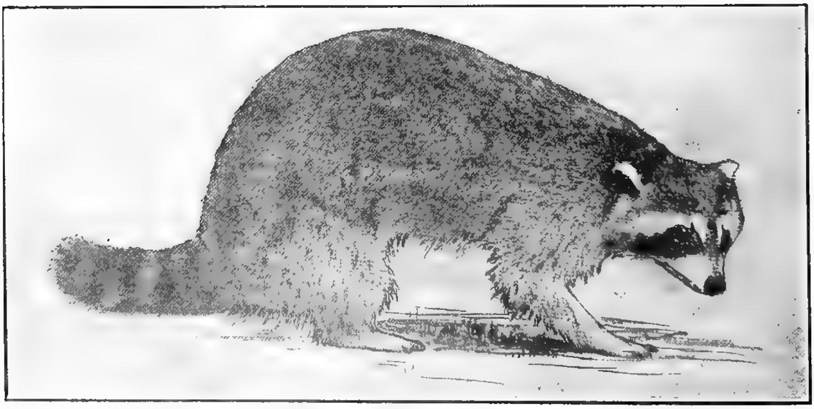
Hogs are often a nuisance to the farm flock and will destroy both old and young. You cannot break them, and the only thing to be done is to prevent the chickens from ranging with the hogs. The sow that has a litter of pigs is generally worse after the chickens. It will never do to risk the fowls around the hog pen. Hogs will nearly always learn to kill chickens if they eat from the same trough, or if the hogs are allowed to become hungry.



Hogs that are improperly fed will often more than eat their value in chickens.

HEDGE HOGS

Hedge-hogs are not considered very destructive to poultry, but they will at times make inroads upon the flock. They make homes in the ground, frequently in some bank. The best method is to either trap or dig them out.



The raccoon often balances his ration from the barnyard flock.

FEATHER AND EGG EATING AND TOE PICKING

Feather eating and egg eating, the cause and method of prevention are thoroughly covered in the Disease Lessons Nos. 26 and 27. The question of toe picking and cannibalism are treated in Lessons 14 and 15, on the Baby Chick. We refer you to them.

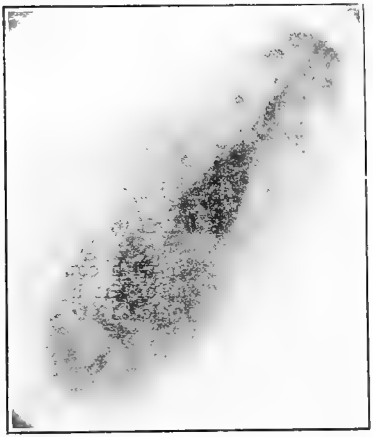
POULTRY INSECTS OR PARASITES

If chickens are to be healthy and grow rapidly, if they are to be profitable and develop into good layers, they must not be stunted and their health impaired by their vitality being sapped by lice and mites. A steady, continuous growth is to be desired.

We class lice and mites and such insects and worms that effect poultry as parasites for the reason that they are living things which gain their living from other living things. They live upon the body of the bird and suck their blood or otherwise deplete their vitality. During the warm season and in certain climates, these parasitic enemies multiply rapidly. They can be more easily prevented by right methods than they can be exterminated after once started.

THE DESTRUCTIVE LOUSE

The lice that prove the worst trouble to birds have long bodies and six legs. There is more than one variety, but they produce a different effect on the fowls. Some exhaust them by sucking blood, but others irritate by crawling over the birds' bodies. They have claw-like feet which add to the irritation. They worry the fowl and interfere with their sleep. This prevents the body from properly performing its function.



The louse in enlarged form looks as vicious as it really is.

Another variety of chicken lice.

You should often examine the head feathers and under the wings and especially around the vent in the fluffy feathers where their nits or eggs are deposited to be hatched out by the warmth of the hen's body. They breed on the young chicks after passing from the older birds to the chicks.

A weak and stunted bird seems to offer the best environment for the rapid multiplication of lice. The bird naturally grows weaker. The bird has pale comb and often times diarrhoea. This kind never lays well.

LICE AFFECT THE PROFITS

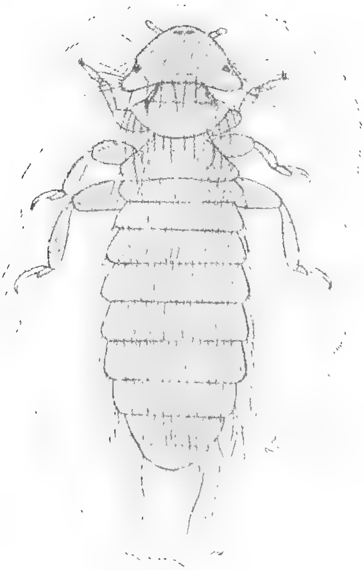
Mites are usually more harmful than lice for they are harder to control. However, lice do great damage and very often cause sitting hens to leave their nests. Hens cannot put on flesh nor produce many eggs if they are infested by large numbers of lice. Your feed will be wasted and your profits reduced if you neglect to protect your flock from the ravages of these pests.

A few lice on a bird do no particular harm. Lice do not suck the blood like mites, but their feet are fitted with very sharp claws and their mouths have sharp biting parts, and they are found constantly clawing and gnawing until the skin of the bird is irritated and inflamed and in some cases bleeding. They are constantly sapping the vitality of the bird, and if the lice are in large numbers, the birds soon lose in flesh, diarrhoea sets in, and in many cases death follows. The successful poultryman gets in the habit of examining his flock for lice and his houses for mites as soon as many of the birds show signs of lack of thrift.

The rasping feet of a louse which irritate the birds.

To merely dust your hens to kill the lice which are on their bodies does not answer. The nits which are on the feathers will hatch and you will have a new generation to contend with if you do not use some sort of ointment or grease in treating your birds.

Where young chicks are being hatched with hens, it is a good idea to dust the hens liberally three or four days before they hatch, but as stated above, this does not kill the nits. It takes oil or grease to kill these, but oil and grease must not be used on the hen while she is sitting. The oil will close the pores in the egg shell and prevent a good hatch by smothering the chick in the shell. After the hatch is over, the hen can be treated. You can use a small sewing machine or bicycle oiler filled with equal parts of linseed oil and kerosene. You can examine the feathers of the hen about an inch below the vent. If you find a cluster of small objects attached to



Large body louse—19 times natural size. Credit of Conn. Exp. Station.

the feathers, these are probably the nits. Take your can and drop a drop of oil on each bunch of the nits. It takes but a very little of the oil. If the chicks get a little of it on them, no harm will be done. Never use pure kerosene. It will blister the skin and cause you a lot of trouble, besides killing the little chicks. By mixing the linseed oil with the kerosene, no damage will be done and the nits and lice killed.

USE OF LICE OINTMENT

We have never found any lice powder to be so effective and satisfactory as a blue ointment, made as follows:

Mercury, fifteen parts by weight.
Lard, fifty parts.
Suet, twenty-three parts.
Oleate of mercury, two parts.

We have recommended it to hundreds of people, and all who have tried it, pronounce it to be very effective. By rubbing just a little on the fluff of a hen with young chicks, it will also destroy the lice on the chicks. Never use it on the heads of young chicks. The advantage of this ointment over powder is this: If you use powder, you only kill the lice on the bird at that time, and there is nearly always a lot of "nits" or eggs on the feathers which hatch in about ten days afterward to start a new generation of lice. But by using this ointment, you destroy the "nits" also, and if any are hatched, enough of the ointment remains on the feathers to kill them.

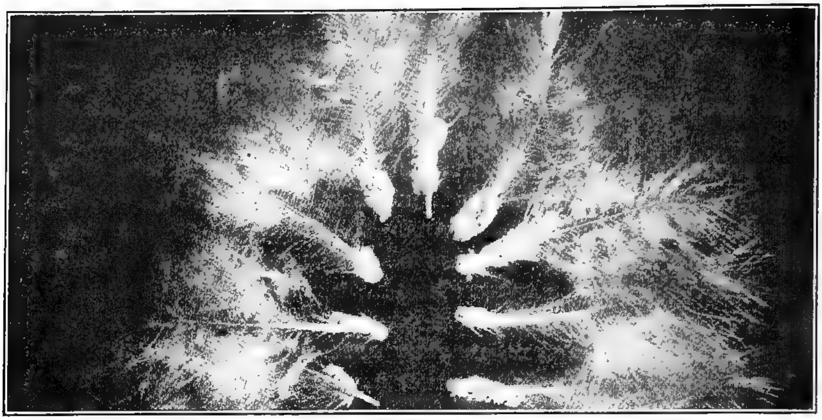
We render the suet and melt the lard. After this is cooled, but before it becomes hardened, we pour in the mercury and oleate of mercury, and with an ordinary table fork, we stir and stir this mixture until the entire mass becomes thoroughly mixed and turns blue. If you find it is going to be too stiff, add a little lard. See that it is well stirred.

Rub about this amount of Blue Ointment on the skin about an inch below the vent and the same amount on each thigh. The ointment should be made by mixing one part of Blue Ointment with two parts of vaseline. Melt a little tallow to mix with it to give it a little more base.

We take a little of this blue ointment (about the size of a garden pea) on the end of the finger and rub it well on the skin and in the fluff just below the vent. Rub the same amount into the fluff feathers on each thigh. Rub down next to the skin and base of the feathers. We are not bothered with lice again for some time. To get the right proportions, we weigh all the ingredients. Do not use this too freely or get it too near the vent for you may kill the hen by so doing. Use an amount about the size of a pea. Also a similar amount in the fluffy feathers on each thigh.

You can buy 33 1/3 per cent blue ointment from your druggist and then have him mix two parts vaseline or lard with every one part of the ointment and use as directed. It is better to do this than to attempt to mix it yourself. It is sometimes difficult to buy the oleate of mercury, but you can buy or order the blue ointment from your druggist. Have him mix two parts vaseline with each one part of the blue ointment and use as above.

Mix a little tallow with it so as to give more base to the ointment and it will remain on the hens longer.



Collection of mites or louse eggs found at the base of feathers pulled from the abdomen of a hen. These can all be destroyed by using the blue ointment mixture.

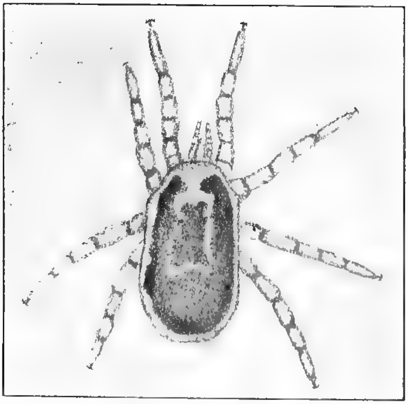
HEAD LICE ON YOUNG CHICKS

You can easily detect the lice on the head of the young chicks with the eye. It is well to keep a continual watch for them.

Or take a teaspoonful of lard and add about five drops of carbolic acid and put the least bit of grease on their heads. Carbolated vaseline is also a good remedy; grease on their heads will kill the lice. These are simple but effective remedies, but must be used very sparingly. The very best and safest thing that can be used for head lice on young chicks is a drop of sweet oil.

THE MIGHTY MITE

There are three principal species of mites which infest poultry, the common grey or red mite, the mites which cause scaly leg and the common red bug or chigoe.



Poultry or roost mite—27 times natural size. Credit of Conn. Exp. Station.

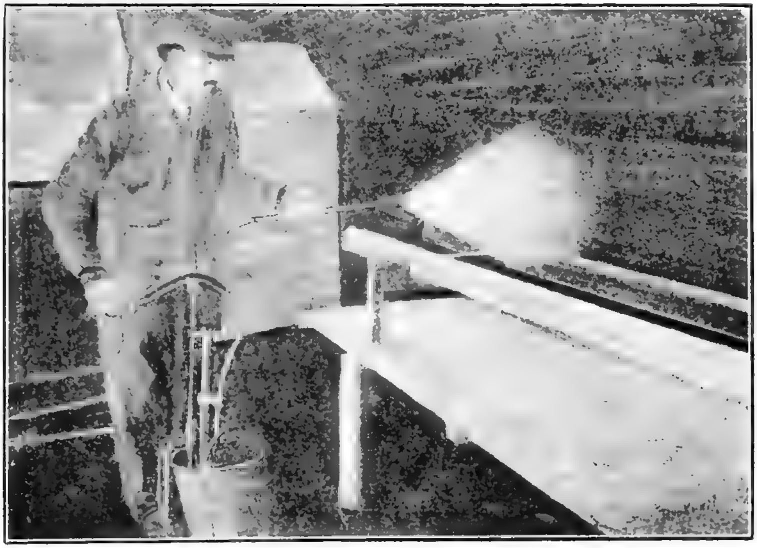
The "mighty mite," commonly known as the red mite. This shows the mite greatly enlarged, as it appears under the microscope. These are very tiny insects but they can put you out of the poultry business in short order if you fail to clean and spray your houses, roosts and nests as should be done.

The mites that infest the houses differ from the lice in their habits. Lice live on the body of poultry and hatch their progeny there. Mites live in the cracks and crevices of the house or any place they can get for a hiding place. From these places they crawl to the body of the fowls at night and prey upon them. They leave them before the birds get off the roost after getting their fill of blood which reddens them, from which we get the name, red mite.

A spray is needed that will penetrate every crack and crevice. Three parts of crude petroleum or coal oil to one part of crude carbolic acid is the best for this purpose as its tendency is to spread and soak into the cracks, thus reaching the enemy. The painting of the roost poles every four weeks with Lee's Liquid Lice Killer or with the petroleum solution will also aid in keeping them in control.

Especial care must be exercised in the setting of hens. One reason that the brood coop is so much more effective for the broody hen is the fact that if you use a house in which to set the hens it soon becomes thoroughly infested with mites unless you are eternally on the lookout, and the hens are often so annoyed that they quit the nests. By using the brood coop and exercising care in dusting the hen and even furnishing her a place in the run to wallow, the danger of lice and mites is reduced to a minimum.

To prevent mites, keep your houses clean. Clean up, rake up, spade up, sweep up, scrub up. There is nothing much better or cheaper to use as a spray for your houses than three gallons of crude oil mixed with one gallon of kerosene. Or use three gallons of kerosene to one of crude carbolic acid. If the wood once becomes thoroughly saturated with either of these solutions and you paint the roost poles and nests quite often with the same solutions or some of those recommended in this lesson, there is not much danger of mites ever doing any damage.



A good hand spray pump should be a part of every poultry farm's equipment. Give every house a thorough cleaning and spray it until the walls, roosts, dropping boards and nests are thoroughly soaked with some of the lice and mite exterminators or spray mixtures recommended in this lesson. Do this each spring and fall.

MITES SPREAD RAPIDLY

In the case of lice, the fowls can protect themselves to some extent, for they can wallow in the dust and in other ways rout the lice to some extent. Mites, however, crawl onto the hens at night, and they are so small that the hen has no way of fighting them and is left absolutely at the mercy of the poultryman and the mites.

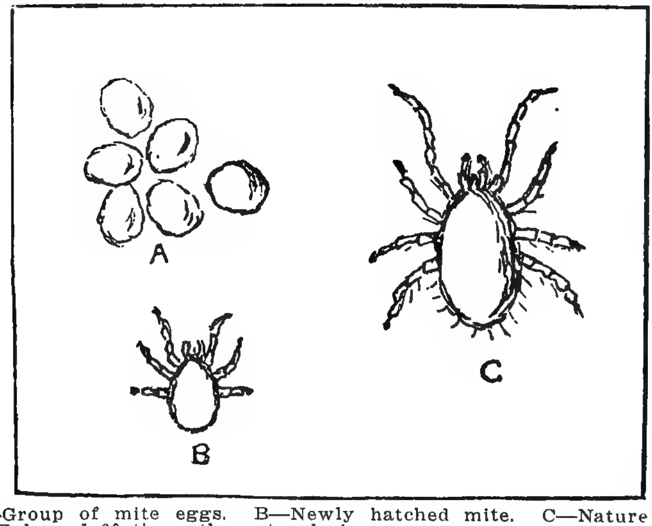
These parasites multiply very rapidly and when once started can soon be found in enormous numbers unless preventive measures are used. Very often birds die and the poultryman is inclined to think it was caused by some disease, when the facts are that it was due to mites. Mites also carry disease from one fowl to another. Sitting hens are often forced to leave their eggs and nests because of large numbers of mites sapping their vitality and continually annoying them. They thrive best in the summer season, but cold weather does not destroy them.

HOW THE MITES MULTIPLY

An authority on the subject, Mr. James B. Morman, made a microscopic study of the life history of these pests and this is what he had to say concerning them:

"By the naked eye a full-grown mite appears as a mere animated dot, but under the miscroscope, it seems to have more or less of a complex anatomy. The body is not segmented like the body of an insect, but forms a single mass. When fully grown the chicken mite possesses four pairs of well-segmented legs, each of which is supplied at the end with a suction valve which enables the mite to hold itself to any kind of a surface. The head has a pair of simple eyes only and the mouth parts are formed for piercing the skin and sucking the blood from the chicken. Respiration is effected by the general surface of the body only.

"Of the mites under the microscope, the females gorged with poultry blood began to lay eggs within twenty-four hours. From seven to thirteen eggs were laid. The eggs are invisible to the naked eye and so are the young mites when first hatched. The eggs began to hatch out in from thirty-six to forty-eight hours, according to the temperature of the room. In hatching the smaller end of the egg slowly develops and unfolds into the head, mouth parts, and the first three pairs of legs, while the larger end of the egg forms the body proper of the mite. There is no discarded shell or covering of any kind, since an egg simply develops into a young mite, which is immediately active and ready for food. As just stated, when first hatched a mite has three pairs of legs only, a fourth pair developing from twenty-four to thirty-six hours afterward; but lack of a pair of legs by no means interferes with the young mite's activity and voraciousness. In a week or so a mite becomes



A—Group of mite eggs. B—Newly hatched mite. C—Nature chicken mite. Enlarged 60 times the natural size.

fully grown, ready to lay eggs, and multiply the pest indefinitely. If left unmolested for a season, the progeny of a single mite will number hundreds or even thousands."

ONE METHOD OF TREATMENT: Red mites may be dealt with effectively.

1. Clean up filth, ventilate house with open front, and let plenty of sunlight into the house.

2. Construct removal roosts and dropping boards, allowing as few cracks as possible. Rebuild the roost in such a way that it does not touch the sides of the chicken house and make it detachable without nails so it may be examined for mites at any time.

3. Paint or spray the roosts, walls about roosts, dropping boards, and nests with full strength solution of two parts oil to one part stock dip or five gallons of lime sulphur to 40 gallons of water.

Applications are made four to six times during the spring, summer and fall, and in pairs, one following the other in five or six days.

GENERAL INFORMATION ABOUT LICE AND MITES

To Rid the Flock and House of Lice

Grease baby chicks on top of heads with a drop of sweet oil.
Dust all sitting hens at least three times during hatching period.
Use blue ointment, licene or other grease on all other hens.
Provide a good dust wallow.

To Rid Flock and House of Mites

Remove all litter in which the pests could hide.
Spray the house thoroughly.
Fumigate if the house can be made air tight.
Paint the roosts and nests with a good wood preservative.

Where Lice Hide

On feathers of the fluff.
Under wings.
On top of head.
On thigh feathers.
On the abdomen, about an inch below the vent.

To Kill Lice

Dust with insect powder.
Provide "dust baths."
Fumigate with louse paints.
Use grease, such as Blue Ointment, Licene, etc.

For Spraying Use

Crude oil, or coal tar disinfectant, or crude carbolic acid and kerosene, or whitewash.

Mites Hide

in cracks and crevices. On the perches. In the nests.

INSECTICIDES

The insecticides used in destroying of insects that infest poultry are divided into three classes—powders, liquids and fumes.

Powders are used to kill such insects as breathe through tubes in the side of their bodies. Those that have other means of breathing are not affected by powders. Others have to be reached by using liquid that is poisonous to the insects or by using something that emits fumes that will destroy them.

POWDERS

Fine road dust, if it reaches the insects that breathe through openings in their bodies, will prove effective. The hen making her wallow soon pulverizes the dirt, if it is dry, and she destroys a great many of the lice on her body.

Persian or Dalmatian insect powder is highly recommended, provided it is pure. Fine tobacco dust is sometimes used, as it is very fine. Dry slaked lime, which is unpleasant to handle, is also used. Road dust combined with Dalmatian powder is very good. The fine dust from coal ashes can be used.

Mr. Rolla C. Lawry recommends the use of a powder made of three quarts of kerosene to one quart of crude carbolic acid. Sufficient plaster of paris is used to absorb the liquid. The mixture is spread upon a heavy paper to dry in order to allow all of the liquid to evaporate. It is then rubbed through the screen of a flour sifter and then it is ready for use.

You can make your own apparatus for dusting the hens by using a can with a top, in which you place a few small holes. In dusting the fowls hold the bird by the feet and work the powder under the feathers thoroughly with the fingers. The lice are for the most part found under the vent. The powder can be used just before the hens are set, but where you have a large number, we think that the ointment we give in another paragraph is better and certainly much easier to apply.

If you use lice powder with which to dust your birds, be very careful not to get any of the powder into the vent. It will irritate the mucous membrane so that diarrhoea will set in and in many cases the birds die in a few days. Many sitting hens have left their nests and many good birds have been killed by this method.

SODIUM FLUORID EFFECTIVE AGAINST ALL LICE

Most poultry lice powders which are placed on the market are not very effective. Perhaps the best thing outside of the one mentioned, and one of the cheapest things for body lice, is Sodium Fluorid. In writing us about this, one of our students recently said:

"With sodium fluorid, which we purchase here for sixty cents per pound, a few pinches of this, possibly a quarter of a teaspoonful, dusted in the feathers where lice and mites are present will rid the fowl completely in three to four days, and she will remain free from lice for several months unless exposed to further infestation. It is as harmless to day-old chicks as it is to hens. A flock of poultry can be absolutely freed from this pest by one treatment if all the fowls are given attention. It seems fortunate to me that so easy, cheap and effective a method is given to our poultry brethren who are fighting this pest all over our land.

"One particular instance might be quoted. I purchased a broody hen from a neighbor this summer which was heavily infested with lice. This hen was given one treatment of sodium fluorid immediately upon being set. One week after the chickens were hatched there were no indications among them of lice of any sort. I might say that a goodly percentage of the lice infesting the hen originally were head lice, and, consequently, would certainly have shown up on the chicks."

Regarding this same thing, the Bureau of Entomology of the U. S. Department of Agriculture recently published these facts:

"The writers have tested a number of the materials most generally advocated for lice destruction and several new compounds which it was thought might be effective. In this series of tests nothing else was found to be as satisfactory as sodium fluorid. The experiments have demonstrated that this chemical is exceedingly poisonous to all species of chicken lice. It kills both adults and young, including the young which emerge from the eggs present at the time of treatment.

"Sodium fluorid can be obtained in two forms, known as commercial and chemically pure. Both of these are in a dry state, the former being a dry powder and the latter consisting of small crystals somewhat lumpy. While the chemically pure material is effective, it is not as easily applied by the dusting method as the more finely powdered commercial form, and, furthermore, it is higher in price. The commercial grade should contain 90 to 98 per cent sodium fluorid.

"This material is the sodium salt of the chemical element known as fluorin, and hence is a compound very similar to ordinary table salt, which is known chemically as sodium chloride. In asking for sodium fluorid it is therefore important that the name 'fluorid' be carefully stated to the druggist. Up to this time the demand for the material has been very limited. Prior to the work of the writers its only known insecticidal use was against cockroaches, for which it has been demonstrated to be very effective. Owing to this limited demand the material is not ordinarily found in drug stores. Druggists, however, can obtain it readily from manufacturing chemists in the larger centers, and with demand it will be carried in stock by many local dealers. The commercial sodium fluorid at present prices should be retailed at from 30 to 60 cents per pound, the price varying somewhat with the amount ordered by the druggist and the distance from the chemical manufacturing centers.

"Sodium fluorid in a dry state does not deteriorate quickly. It should be kept in a dry place either in bottles with stoppers or in closely covered cans. In this condition it will remain active indefinitely.

METHODS OF APPLICATION

"In treating poultry with sodium fluorid,*if proper methods are followed, a remarkable degree of control is obtained. One application of sodium fluorid to all fowls on given premises will completely destroy all lice present.* It is essential to make sure that the treatment is thorough and that every fowl is treated, for if one infested chicken escapes it will in a short time reinfest the entire flock and thus make it necessary to do the work over at a considerable loss of time and money.

"Sodium fluorid may be applied in two forms, as a dust and as a dip. In using either form, the first step is to see that all fowls are shut in the poultry house or placed in coops prior to beginning treatment.

DUSTING

"The action of sodium fluorid, when applied in dust form, is comparatively slow; hence, if fowls are examined the day following the treatment some lice may be found, but if the treatment is thorough and every fowl is treated, the material persists, and after four or five days all lice disappear. Apparently the hatching of the eggs is not prevented, but the young lice find sufficient material present in the feathers upon emerging from the eggs to destroy all of them.

"For complete destruction of lice it is essential to place small amounts of the material on different parts of the infested birds. Contrary to the usual belief, all species of lice do not migrate freely from one part of the bird to another, hence the material must be well distributed to bring it in contact with all lice present.

"The writers have found what they term the 'pinch method' to be entirely effective against all lice and to have the advantage of economy of time and material. When applying the material by this method, it is placed on a table in an open vessel, and the fowl is held by the legs or wings with one hand, while with the other hand a small pinch of the chemical is placed among the feathers next to the skin about as follows: One pinch on the head, one on the neck, two on the back, one on the breast, one below the vent, one on the tail, one on either thigh, and one scattered on the underside of each wing when spread. Each pinch can be distributed somewhat by pushing the thumb and finger among the feathers as the material is released. It is advisable when dusting to hold the chicken over a large shallow pan, as in this way the small amount of material ordinarily lost is recovered.

"The material may be applied by means of a shaker, but this method has some disadvantages as compared with the pinch method. Small nail holes are punched in the bottom of the can, which is provided with a close-fitting lid on the other end. The material is then shaken into the feathers with one hand, while the feathers are opened with the other. This necessitates the presence of a second person to hold and turn the fowl. When this method is followed the amount of sodium fluorid used may be reduced by adding four parts of some finely powdered material, such as road dust or flour, to each part of the chemical. If the material is employed alone, somewhat more of it is used than by the pinch method, and more or less dust floats in the air, which causes irritation of the throat and nose. This can be avoided largely if the operators wear dust guards over the nose or keep pieces of wet cloth over the nose and mouth.

"Although the writers have not applied this material with a dusting machine or revolving barrel, they are of the opinion that this would not be thorough, might bruise the fowls, and would be irritating to the air passages of the birds.

"Precaution should be taken not to allow sodium fluorid solution to remain in galvanized vessels any great length of time. In fact, it is best not to keep it over night in tubs or galvanized containers, as it will injure them."

COST OF APPLICATION

One pound of commercial sodium fluorid, when applied by the "pinch method," will treat approximately 100 hens; thus at a cost of 60 cents per pound, the expense for material will average a little more. The ointment is a little more expensive, but can be applied more rapidly and if properly mixed is effective for a longer period.

It is seldom necessary to apply sodium fluorid more than once where the dusting or dipping method is applied, but where the "pinch method" is used it will be necessary to repeat the operation in two weeks, as there is a probability that some of the lice will escape. The dusting method, if thoroughly applied, is the more complete remedy, but is by far the most costly.

USE OF SODIUM FLUORID FOR BABY CHICKS

In treating baby chicks, take a pinch of sodium fluoride and apply half of it to top of head and the other half below the bill, and scatter one or two pinches over the rest of the body, depending upon its size and age.

Care must be exercised in dusting baby chicks. Dust them on warm, sunshiny days and during the morning hours. At the same time dust the mother to prevent transference of lice. If the day is cold, the baby chicks will crowd beneath the mother and in this way obtain some of the poison internally, resulting in the death of the chicks. Always treat the hens before the hatch comes off and it will not be necessary to dust the chicks.

DIPPING.—The dipping method is recommended when weather conditions are favorable, that is, in mild weather on a bright, sunny day. This is especially true when twenty-five or more fowls are to be treated. This insures thoroughness, reduces the time used in treatment, and if fifty or more fowls are to be treated, dipping reduces the cost of material. Furthermore, the irritation of the nose and throat of the operator by the powder is avoided. Of course, for the treatment of fowls in winter or for young chicks or sitting hens, the pinch method as described should be followed.

In preparing for dipping, a medium sized tub is filled with tepid water to a depth of at least 8 inches, the water being measured. One ounce, or three level tablespoonfuls, of sodium fluorid is added for each gallon of water. While the material dissolves readily in water, it is necessary to stir the solution before dipping.

To dip, firmly hold the fowl by the base of the wings and submerge it in the dip. With the other hand, ruffle the feathers so that the dip will touch the skin and partially wet the feathers, then duck the head a couple of times. Choose a warm, sunny day, and complete the dipping some time before sundown. The feathers are not wet very thoroughly by this treatment and the fowls will dry in a very short time. There is no injury to the skin or feathers and the latter are not discolored. The meat is not tainted in the least.

Immediately after the dipping operation, dispose of the dip where there will be no possibility of the chickens drinking it. Also, if a galvanized iron tub is used for the dip it should be emptied and rinsed at once to prevent a chemical reaction from the sodium fluorid.

Commercial sodium fluorid may now be obtained from any large wholesale drug house in five-pound lots, from a number of the drug stores, a few seed and hardware houses, and the large mail order houses. It should be sold at retail at from 30 to 60 cents per pound.

TOBACCO RECOMMENDED AS LICE AND MITE EXTERMINATOR

One of our students is the daughter of a prominent cigar manufacturer, and she highly recommends the use of tobacco in the extermination and eradication of lice and mites in poultry houses. She has this to say concerning the method she recommends:

"My father was a cigar manufacturer for a period of 40 years. During that time, he kept a flock or a pen, but while his houses were so cheaply constructed that they made a harbor for mites and lice, yet during all this time, they were never infested with either lice or mites.

"There is no excuse for having lice or mites in any building or on poultry of any kind. You can try it out yourself, and I will warrant you will have no lice and mites in buildings treated in this manner, and that there will be no possible danger to hens or chicks. The remedy is very cheap and simple, yet I know it works in every case.

"All my father did was to take a quantity of tobacco stems, stalks or waste tobacco of any kind and place them in a wooden bucket, barrel or tub. Fill the container with water and then weight it down, covering it with stones, boards, or something of that nature. Let this stand over night; in fact, until the water will be about the color of molasses, the stronger the better.

"We used a brush with which to apply the liquid, but a spray pump might be better, provided you filtered the liquid through a cloth to prevent the clogging of your spray pump. Thoroughly saturate the cracks and crevices in your house, including perches, droppings boards, and the corners of the nest boxes. Be sure to apply it to all parts of the house where there is danger of mites and lice hiding.

"Two or three times during the first summer this remedy is used, soak the ends of the perches so that all lice or mites, coming or going, will be destroyed. After the wood is partially soaked with the fluid, only a slight painting or spraying each spring and summer will be necessary."

This student believes in this preventive so much that she recommends that poultry raisers grow a few tobacco plants, raising them about the same as they would cabbage. If they cannot secure the tobacco in any other manner, they can at least grow a few plants. She advises drying the refuse after the liquid has all been removed, and scattering the dried tobacco stems, leaves, etc., in the litter of the poultry house.

LIQUID INSECTICIDES

To reach those insects that infest the house in order to reproduce their progeny, a liquid is the best thing that can be used. It is possible to use a spray pump and reach all of the parts of the building. There is nothing better than crude kerosene, three parts, and one part of carbolic acid. If the crude oil cannot be found, use the commercial kerosene. This liquid solution should be applied thoroughly to the roost poles, nests, cracks, crevices and rails of the house. If they are saturated once a month or every six weeks in spring and summer months, it will not take long to eliminate the mites. It is sometimes advisable also to paint the floors. By this method germs of diseases are destroyed as well as insects.

When this solution is used on the nest boxes, they should be allowed to stay in the sun a few hours. There are many kinds of commercial preparations that are put on the market for use in spraying. Many of them are effective, but the coal tar products are generally the basis of them.

About two ounces of carbolic acid to a gallon of water makes a very good insecticide. Carbolic acid can also be put into whitewash and is effective. It is a mistaken idea that whitewashing the house will answer the purpose of cleaning it of insects. When carbolic acid is added, when the whitewash reaches the insects, it will kill them. It is better to thoroughly spray the house before using the whitewash. We like spraying better than whitewash. Remember that the roosts, walls and nests must be sprayed until they are saturated about every eight weeks during the hot weather. Do this work early in the day so that the houses may dry out before confining the fowls to them again.

Take a can of liquid lice killer, or a mixture made of three parts of crude oil mixed with one gallon of kerosene, or some similar mixture, and paint your roost poles twice each month in hot weather and once a month at other seasons of the year.

KILLING INSECTS BY FUMES

It is possible to destroy disease germs and many insects by fumes. Sulphur is one of the easiest things used and probably one of the most effective. You can use powdered sulphur or get the sulphur candles. Place the sulphur in an iron container and moisten with some inflammable liquid to make it burn rapidly. Tobacco and creosote are also used. Use the waste materials from the tobacco and saturate it with something to make it burn.

TURKEY LICE

The body louse of the chicken is probably the most common and injurious pest attacking turkeys. It infests the turkey the same as it does the chicken and when present may be found upon the skin below the vent, the eggs being deposited there in masses at the base of the feathers.

The large turkey louse is, strictly speaking, a genuine turkey louse. It is a very large, brown louse with a prominent head, having two projections extending backward. It is to be found upon any part of its host except possibly the head and wings. There is also a very large turkey wing louse. When present it is found between the barbules of the large wing and tail feathers. Diarrhoea, drowsiness and loss of vitality will result if the turkeys are badly infested with lice.

It is a common practice for people to hatch turkey eggs beneath a hen. When this is done there is usually a great deal of trouble resulting from head louse injury. The louse in question is the common chicken head louse. It is found in great numbers attached to the feathers on top of the head of young turkeys and its injurious effects are equally as apparent as in the case of young chickens. One large louse on the head of a young poult will sometimes kill the poult if it is not removed. The lice can also be found under the wings of the young turkeys.

Control.—The same as for chicken lice or for head lice on young chicks as explained in the Baby Chick Lesson.

LICE AND MITE EXTERMINATORS

Among the many lice and mite exterminators the following has been recommended as being very effective. We give a number of different methods of ridding flocks and houses of these pests for the reason that some student may find one thing more easily procured than another. If we recommend only one thing, there might be times when that particular thing could not be found in certain communities. So you might try the following:

Cresol Soap. Dissolve a ten cent cake of laundry soap in one pint soft water; heat or allow to stand until soap paste is formed. Add one pint cresol; beat or allow to stand until soap paste is dissolved. Stir in one gallon of kerosene. Dilute with ten to fifty parts of water and apply with spray pump or broom.

Cresol-Kerosene Paint. To three parts of kerosene add one part of cresol. Apply with brush as a paint."

CRUDE PETROLEUM is very effective. It is cheaper than most things and retains its killing power for several weeks. It sprays better if one gallon of kerosene is mixed with every three or four gallons of the crude oil. No matter what kind of material is used for spraying it is always best to strain it or pour it through a screen wire to rid it of all foreign particles which might interfere with your spray pump. Where crude oil is used, it is best to repeat the application in about a month, and it is sometimes necessary to give a third application. The roost poles and the interior of the nests can be painted with crude oil. Poultry should be kept out of a building until the oil has become thoroughly soaked into the wood.

LIQUID LICE KILLERS and similar preparations made by well known manufacturers can be used with which to paint the roost poles, nest boxes, cracks and crevices. If this is done once a month it will go a long way toward keeping down these parasites after the wood is once well saturated.

Naphthalene-Kerosene Emulsion. This emulsion is the most effective and safest mixture for killing mites (red mites) and nits. It is also very effective as a disinfectant. It is made thus:

Naphthalene, 1 pound.
Kerosene, 1 gallon.
Laundry soap, 4 ounces.
Water (soft), 2 quarts.

First dissolve Naphthalene in Kerosene, then dissolve Soap in boiling water, when thoroughly dissolved mix all together while hot and stir briskly until the mixture has formed an emulsion. This is your stock and it must be well covered because Naphthalene volatilizes (evaporates). When using this add five gallons water (soft) to one gallon of the emulsion, to this add two quarts of strong vinegar. Kerosene and Naphthalene will kill mites and vinegar and soap will kill "nits." Apply with sprayer or brush.

THE LIME-SULPHUR SOLUTION can be made as follows:

Unslaked lime, 8 ounces, powdered Sulphur 1 pound, water 4½ gallons; boil for two hours. Apply with sprayer.

WOOD PRESERVATIVES PREVENT MITES

We have found the wood preservatives sold by most lumber dealers to be about as effective as anything to prevent mites. They not only act as a preservative for the wood, but if the roosts, nests, cracks, crevices and joints are carefully painted, these preservatives will expel the mites and prevent them. The Connecticut Experiment Station recommends this method very highly:

"The control of a parasite must of necessity be regulated to meet its method of attack. Because the mites are usually hidden either in cracks or holes in the roost or about the poultry house, having to pass over the roosts to attack the hens, it is important that the roosts do not offer hiding places for the mites. An application to the roosts and particularly to the boards supporting the roosts that will either repel or kill the mites as they crawl over these points to reach the hen is the efficient method of control.

"In comparison with kerosene oil, zenoleum and carbolic acid we have found that carbolenium is a far more effective means of ridding the hen house of the roost mites. Containing a coal tar product and carbolic acid it acts as a wood stain and remains effective for a long period of time, being even more effective than pure carbolic acid. While carbolenium is recommended because it has been tried and found most efficient it is quite likely that other coal tar products have a similar degree of effectiveness. These are sold under different trade names, one of which is 'Flykill.' For flocks of hens where a comparatively small quantity of liquid is used for mites we would recommend using carbolenium, but for those who need larger quantities we would recommend one of the coal tar mixtures that can be bought by the barrel at a lower rate.

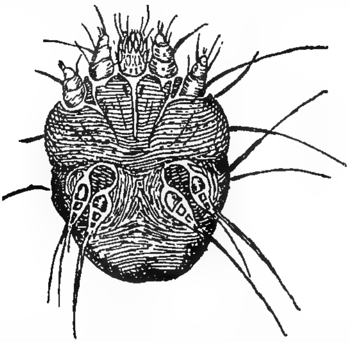
"*Discretion is necessary in the use of any of the coal tar products as an excess amount either on the roosts or on the adjoining boards may result in eye trouble to the hens or chickens.* To avoid this it is best to make the application when changing the stock from one house to another, giving time for the mixture to dry into the wood for at least two days, or if treating the house for chickens, allow a week or ten days for it to become thoroughly dry. If this cannot be done it is better to dilute the product with kerosene or to apply sparingly with the brush, wiping off the excess with an old rag and allowing the place to dry for a day before returning the stock to the house. If roosts are allowed to dry outside of the poultry house there is less danger of injury to the fowl. If used regularly each year one application is usually sufficient. Should there be signs of the return of the mites, however, another application should be made or if the houses are badly infested two or more applications may be necessary."

WASTE OIL FOR MITES AND SPRAY

The waste oil and greases which are removed from crank cases and from autos and which accumulate about most garages are usually turned into the sewer. These waste oils and greases make an excellent preventive and exterminator for lice and mites. If you will mix one gallon of crude carbolic acid with each three gallons of the waste oil and use it as a spray or paint, it will prove very effective in keeping down lice and mites in a poultry house. This oil has lasting qualities when used in this way, and when the roosts, nest boxes, cracks and crevices become saturated with it, they cannot live in the house. All paints or sprays should be applied in the morning to give them time to soak into the wood before the fowls occupy the house or use the roost poles.

SCALY LEGS

There is nothing much more unsightly than to see a bad case of scaly legs. It is the result of gross neglect on the part of the poultryman. It



View of adult female scaly leg mite greatly enlarged.

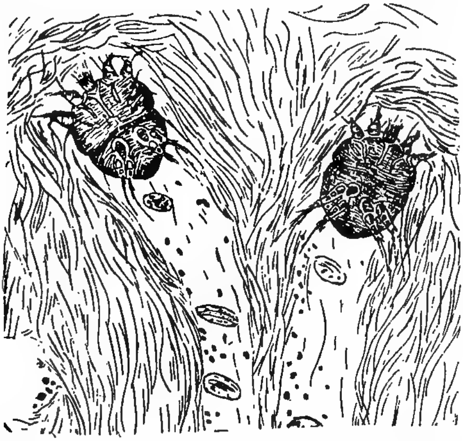
takes a very little time and trouble to cure a case and a little care will prevent its return.

We have seen cases so bad that the leg of the fowl was badly deformed, the natural color and scales permanently destroyed and the bird actually lame as the result of scaly leg mites. No bird can do its best as a layer or breeder when in this condition. A show specimen stands but little chance of winning when affected by this disease. So from every standpoint it pays to eradicate this from your house and flock.

This disease is caused by a small parasite which works underneath the scales of the legs. An irritation is caused by these intruders and the tissues of the leg of the bird are stimulated to greater activity in trying to expel the parasites and throw them off. This only makes it better for the purposes of the mites, for the serum exuded furnishes them better surroundings in which to work and multiply. So they increase in great numbers, if left alone, so that in some cases the legs of some birds are almost eaten to the bone.

The mite which causes scaly leg burrows under the scales and secretes a chalky looking substance which causes the scales to rise and render the legs very unsightly in appearance. This trouble is easily communicated from one fowl to the other and should be checked at once whenever found.

Symptoms: The disease does not disturb the general health of the fowl. These small parasites, which bore under the scales of the legs and feet, cause the scales to rise, and in case of long standing, the scales and color of the legs disappear entirely.



View of two adult female scaly leg mites at work under the scales. Eggs and excreta following them. Enlarged.

The mites become more numerous and bury deeper until in some cases the bird loses a toe and becomes lame by the leg being eaten almost off. It makes a very unsightly appearance to say the least.

Birds that are affected should be kept in a dry building which is clean and sanitary and the floor should be covered with straw. Take a pan of warm water, plenty of soap and a brush, and after the legs have been soaked in the soapy water, scrub them thoroughly with the brush. Remove all the old scales that you can after they have been softened up, but be careful not to make the leg bleed. After they have been removed from the water, dry the legs before applying the treatment.

Cases of scaly leg can be cured by dipping the leg of the bird into a can of kerosene. Be careful not to get the kerosene closer than within an inch of the knee joint. If the oil is permitted to get onto the feathers or the skin of the fowl, it will become blistered and we have known of cases where birds have died as a result of this treatment. Another objection to the coal oil is the fact that it discolors the leg, if the bird is intended for show purposes, a better remedy would be to apply crude oil or petroleum to the leg with a brush or dip the legs in a small can of this oil.

The parasites pass from one bird to another and are caused by gross neglect upon the part of the poultryman. The roost poles should be smooth and should be kept painted with some liquid lice killer or with two parts coal oil mixed with one part crude carbolic acid. Use a stiff brush to wash the bird's legs thoroughly with soap and water as stated above. After drying, apply the following ointment:

Four teaspoonfuls of washed sulphur or enough to make a paste or ointment.

Twenty drops carbolic acid.

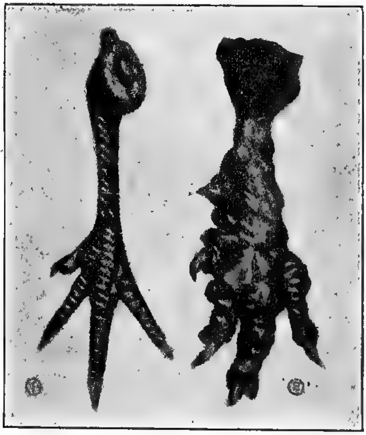
Two tablespoonfuls of vaseline or lard.

Two tablespoonfuls of kerosene.

Mix these and make a salve or ointment of them before applying to legs. Rub the ointment well up under the scales of the legs.

The blue ointment mixture which is recommended in this lesson for body lice is also good for treating the legs for scaly mites. It must be well rubbed in and the surplus rubbed off to prevent soiling the plumage.

One treatment is to use a little zenoleum or creolin in warm water and soak the legs until the scales and crusts are softened and the legs carefully cleaned. When they are dry, use carbolated vaseline, crude petroleum or the ointment mentioned on page 32.



No. 1 shows a normal leg of a fowl. No. 2 shows a leg in very bad condition caused by scaly leg mites.

CHIGOES OR CHIGRES

Chigoes or chigres belong to the flea family, having four legs with the body divided into two parts. They exist in nature and get their living from plant life, but if animals are present they prefer to suck the animal's blood instead. This they do by piercing the skin and with the lash tongue first inject a poison which partly digests the blood and then it sucks the blood and poison out together. This poison which is injected causes a swelling of the flesh.

These little creatures are most numerous during June, July and the first half of August.

The chicks which are hatched during these months usually suffer from the effects of these little creatures. It is better to hatch the chicks either earlier or later so they will avoid this pest.

Keeping the birds away from the runs where these chigoes grow is one of the best ways of controlling them. They live in prairie grass, dog fennel, etc. Grease the bird's legs if running on range.

MOSQUITOES

In many sections where mosquitoes are bad they prove a great annoyance to the fowls. In some experiments that have been made, evidence was gathered that they proved a source for the spreading of sore head, which is so common in southern countries. The only thing to be recommended in this case is to screen the roosting quarters and keep out the mosquitoes at night. They will not likely trouble them much during the day time.

DEPLUMING MITES

There are two kinds of depluming mites. One gnaws the skin and irritates it at the base of the feathers so that in her desperation the hen pulls out her own feathers. The other lives on the feather, which causes the bird to have a ragged and ugly appearance. In some cases the quill is so weakened that the feather drops off. This does not necessarily injure the health of the birds, yet it spoils their appearance and no bird can lay as many eggs or do as well as it would if it were free from them.

One part of blue ointment mixed with three parts of carbolated vaseline rubbed on the affected portion of the bird usually effects a cure. Do not use a great quantity of this mixture at any one time, but repeat it if necessary. Also crude petroleum, carbolated vaseline or oil of cloves rubbed into the parts of the skin and feathers infested has been recommended. Add a tablespoonful of stock dip to a cup of melted vaseline or lard, mix thoroughly, and when cool, apply a little to infested parts.

AIR SAC MITES

The air sac mites inhabit one section of one fowl and may be found in another portion of another bird. The mites are usually found in the air sacs between the leg and the breast, in the abdominal air sacs, the air spaces of the bones, and in the air cells of the lungs. If there are only a few their presence will not be noticed, but if they are in large numbers, it will likely prove serious. The bird becomes thin, the wings droop, the comb is pale and a coughing or rattling sound in the throat may be noticed. When the bird is killed and examined you will notice the mites in minute specks. They may be yellowish-white in appearance.

It is very difficult to rid a flock of this disease. It is usually best to kill the birds and disinfect the premises. None of the birds should be sold to anyone for breeding and none sold for market that are known to be infected. It is said that sulphur fed to these birds will kill these parasites, but I do not believe this to be true. Do not attempt to use or breed such birds.

TICK INFESTATION

These are also found largely in the southern portion of the United States. They have a thin and flat body. The mouth is found on the underneath side and is so arranged that the tick fastens itself to the bird and sucks the blood. Sitting hens leave their nests and birds cannot thrive where large numbers of these pests are found about the premises. Use sanitary measures and combat them with the same treatment recommended for the prevention of lice. Treat the houses in the same way.

FAVUS

This is a disease of the comb and skin of the head, but it is due to a fungus and not a parasite. However, we will mention it here. It is highly contagious. If not treated, it will spread and result in serious trouble. It first appears in small patches on the face, comb or wattles. It is a crust, light gray or whitish in color, and, if allowed to develop, from in four to six weeks, may spread over a large area and be one-fourth inch in thickness. The feathers become dry and brittle and break off very easily, leaving a bare surface affected by the disease. A bad odor may be noticeable. The bird will become weak and die if not treated.

These cases must be taken in their early stages. The crusts must be soaked with soapy water which contains five per cent solution of zenoleum, creolin, kreso dip, carbolic acid, or five per cent solution of some other antiseptic. The houses and equipment should be treated as for lice and mites.

CHICKEN FLEAS

Chicken fleas are not very common but their effect is similar to that of lice. In some cases they have been known to become quite numerous and troublesome. The best remedy is to dip the hens in a five per cent zenoleum solution, five per cent creolin, five per cent kreso dip, or dip such as is used for lice and mites on poultry or live stock.

The house should also be treated as recommended for lice and mites.

THE POULTRY BEDBUG

In some of the Southern States these pests are found in great numbers. They swarm over the roosts and nests and suck the blood of the fowls. If they are not eradicated, they, of course, soon have the same effect upon a flock that lice and mites have. They sometimes become so numerous that it is necessary to keep the birds out doors continuously in those warm climates. These bugs live for a long time on the filth which they find in a house; it is therefore necessary that the house be most thoroughly cleaned and every particle of filth eliminated. Treat the house the same as is recommended for the eradication of lice and mites.

BLUE BUGS

In many Southern States ticks, or "blue bugs," infest the grass, weeds and sticks and are a serious pest for old fowls, and a very fatal one for young chicks. These may be prevented by keeping chicks in small runs and keeping the runs clean and free from weeds, grass, etc., until the chicks are up in size. A simple remedy may be used as: Two tablespoonfuls lard, one-half teaspoonful flower of sulphur. Grease the back of the heads and wings where ticks are most inclined to stick. Do not grease the entire chick with this mixture, nor should any sulphur mixture be used largely if the weather is damp and rainy.

BEDBUGS AND OTHER INSECTS

We have seen houses thoroughly infested with bedbugs which are a great annoyance to poultry. Creolin put in water for a spray will kill the bedbugs. Until they are thoroughly eliminated it would be well to spray for them every two weeks. The kerosene and carbolic acid solution which has been recommended for mites and for spraying is best for bedbugs and for all other kinds of insects with which poultry are troubled. Mix equal parts of kerosene and carbolic acid if you find it necessary to make such a strong solution to kill bedbugs or other insects.

The parasites that infest turkeys are larger than those that infest chickens. Their habits and general characteristics are the same. The same formulas that we have given you for the treatment of lice on chickens can be used with the turkeys. They are very dangerous to the young poults, in fact cause more trouble than does disease. The young turkeys get infested from the mother hen about the head and vent soon after they are hatched if the mother happens to have them on her. However, they can also be infested with the same kind of insects that trouble the chickens.

The special kind of insects that infest ducks are also different from those that infest turkeys and chickens. They will sometimes, however, pass to other kinds of poultry if they happen to be on the ducks in great numbers.

The pigeon lice are also unlike the others that we have discussed. They are long and slender and brown in color.

It is really more difficult to keep vermin from pigeons than any other variety of fowls, for they are closely confined and the fact that they stay on their nests so much renders the breeding of insects favorable. Then they do not wallow as do hens and clean themselves in this way. Pigeons also become infested with fleas, ticks and red mites.

When insects are present in great numbers squab raising is rendered very difficult. The parasites will either check the growth of the squabs or kill them.

CHIGGERS OR RED BUGS

One of the most heartily condemned bugs in the southern and central states is the chigger or red bug, says Prof. F. C. Bishop, United States Department of Agriculture, which makes life miserable when one gets a good infestation of these tiny pests after a walk in the grass and weeds. The normal hosts for these small mites are thought to be various insects, but they attack chickens with avidity, and occasionally domestic animals as well as man.

Chiggers are in reality the young or larvae of certain large ground mites which in the adult stage are entirely harmless. They are scarcely visible to the naked eye and are of a bright scarlet color. They attach to the skin of chickens where the down or feathers are thin, especially on the breasts, under the wings and on the front of the thighs. Usually a great many fasten in a bunch and they produce swelling and often suppuration. Small chicks soon become droopy and often die if heavily infested and older fowls are irritated enough to affect growth and egg production. The little mites suck blood and increase considerably in size, then drop off after a period of three to five days.

With this pest, as with many others, the late hatched chicks suffer most. Usually very few chiggers are present in north Texas until about the first of May, and farther north they are somewhat later in appearing. Hence early hatching is one of the principal methods of avoiding injury to young chicks.

As the chiggers are always more abundant in rank growths of woods and grass it is advisable to keep the vegetation on the range closely cut. Young chicks should never be allowed to run out in weeds and tall grass. The chiggers may be destroyed by applying a small amount of carbolated vaseline or lard and sulphur to the masses, being careful not to get grease on the chicks except where the parasites are located. Sulphur dusted in the feathers tends to keep the chiggers off for a few days.

THE FOWL TICK OR BLUE BUG

Ticks which infest fowls and which do great damage in certain states and cause great loss in portions of California, Texas, Florida, Oklahoma, New Mexico and Arizona can be controlled by the use of the measures recommended below. It is important that you know something about the life history of this troublesome pest. Dr J. W. Patton of the Texas Agricultural College, has done considerable investigational and experimental work with the Fowl Tick and we want you to know just what he has to say with reference to this parasite:

"*Hosts.*—Domestic fowls, turkeys, geese, pigeons, ostriches and canaries.

"*Life History.*—The eggs are deposited in cracks and crevices about the house, roosts, and under the bark of trees, fence posts, etc., in fact, in any place there is a place to secret themselves and deposit the eggs. The hatching period varies according to the season of the year. In summer it may be ten days or two weeks, and in winter it may extend over two or three months.

"*Injury Produced.*—

1. Through death of old and young.
2. Retarding the growth of the fowls infested.
3. By lowering the vitality, thus rendering the fowl more subject to disease.
4. Reduction in egg production.
5. Irritation and annoyance to the fowls.

"*Seed Ticks.*—When hatched, the young seed ticks soon make their way to the host and engorge themselves with blood. This feeding period lasts from four to ten days. After feeding, they then drop from the host and make their way to cracks and crevices. Before feeding the seed ticks are of a grayish color; afterwards they take a bluish hue. These seed ticks then undergo a molt and develop into what are called nymphs.

"*Nymphs.*—These nymphs are different from the seed ticks, in that they attach themselves to the host for feeding only for a brief period, usually at night. They then undergo further molt, and finally develop into the adult ticks.

"*Adult Ticks.*—The main difference between these and the nymphs is that the adult is sexually mature, and that they are slightly larger in size. As a rule the male is smaller than the female. Contrary to most ticks, this species does not die after ovulation and feastings. These ticks are remarkable in the length of time that they can live without food. Seed ticks have been known to live five and one-half months, nymphs for nine months, and the adults anywhere from two and one-half months to five years. This is important when combating these pests, as houses unoccupied even for a period of years may still harbor them in large numbers.

"*Injury to Host.*—Ticks possess a strong beak attached to the ventral (under) side of the anterior (front) part of their body, by which they attach themselves to their host and produce the injury outlined under "Injury Produced."

"*Control Factors.*—Ticks do not thrive in a warm, moist climate. A warm temperature is favorable, but excessive moisture is adverse to their natural development. They do not occur in cold regions. They can, however, stand considerable cold weather. A few parasites are known to attack the fowl tick. A species of ant, certain species of spiders, rats and mice will destroy a small per cent; fowls themselves will eat them, but due to the habits of the ticks they are only able to get a small amount, as also is the case with birds. The fowl tick is much more difficult to destroy with chemicals than is most ticks, due to their natural resistance and their mode of living.

"*Treatment.*—Investigations show that it is not advisable to dip the fowls or to apply any substance to their body, as practically anything which would be sufficiently strong to destroy these pests, so immune to most chemicals as they are, would be more or less injurious to the fowls themselves. The poultry house is the most vulnerable point of attack, and for this purpose many substances have been tried.

"It is necessary that any substance used to combat these pests should have the following points:

1. High killing power.
2. Should be penetrating and lasting in its effect.
3. Should be inexpensive.

"Crude oil has been used quite extensively and successfully. It embodies the above principles. Crude oil and kerosene also have been used to some extent though kerosene of itself is of very little use. The following mixture has given very good results: Crude oil 4 parts and kerosene 1 part. Whitewash and boiling water are of very little use, if any, and the same might be said of insect powders. Any substance used should come in actual contact with the ticks. The secretive habits and the resistance of the tick is such that any substance used should be forced into the cracks and crevices in sufficient amounts and with continued treatments at least every thirty days if any remedy is to be effective. Before any treatment is used the house and fixtures should be thoroughly cleansed, then sprayed, also thoroughly spraying the fence posts, etc., and, in fact, any place where they might secret themselves should not be overlooked.

Our investigations show that with intelligent and vigorous attack the pest can be controlled or completely destroyed. The same method as advocated for the common mite has been found very successful in combating this pest. Anthracene oil is to be preferred rather than crude petroleum, as it is more destructive and more persistent. The proper construction of the roosts and nests is imperative and following the first thorough spraying of the hen houses, painting the roosts and nests two or three times at sixty or ninety-day intervals will keep all ticks from developing, though it is necessary to watch the roosts for a year or more as some ticks are sure to escape the spray and may get to the fowls and feed.

"*Methods of Preventing Tick Infestation.*—It is much easier to exclude ticks from clean premises than it is to destroy them when premises are infested. Those contemplating entering poultry farming should bear in mind the following (if they are in the zone where ticks are prevalent):

1. Fowls free from ticks.
2. Clean premises.
3. Quarantine of all new additions to the flock for a period of ten days.

"The houses and equipment should be as free from cracks and crevices as is possible, and with systematic spraying of the house and the painting of the roosts and platforms periodically it would be difficult for the ticks to get a start.

"Tick-proof houses would also help to solve the problem. These may be made of corrugated metal on either steel or wood frames. The treatment recommended would be beneficial for the control of most mites affecting poultry. There has been a number of remedies put on the market for the eradication of ticks both from the fowl and the premises. Some of these are quite effective, but not any more so than crude oil, and as a rule they are much more expensive. There is no remedy that may be fed to the fowls which would be sufficiently strong enough to destroy the ticks and at the same time not be injurious to the health of the fowls themselves.

Conclusions

"1. The chicken tick is a serious pest to poultry, especially in the southwestern states.

"2. The fowls are often killed by it.

"3. No flock can thrive, let alone produce, if infested to any extent.

"4. The adult ticks are secreted in the cracks and crevices of the house by day and feast on the fowl by night.

"5. The young seed ticks are found on the fowl for the first four to ten days, then they drop off and secrete themselves, as do the adults and the nymphs.

"6. The main difference between the adults and the nymphs is the fact that the former are sexually mature and capable of reproducing.

"7. Ticks may live from five and one-half months for the seed ticks to five years for the adults without food.

"8. Only systematic spraying with proper penetrating substances which when used in sufficient amounts finds its way into the cracks and crevices is efficient.

"9. The spraying should be done systematically and periodically, as no one spraying is sufficient to control these pests, regardless of what is used.

"10. Construct buildings as free as possible of cracks and crevices and have portable fixtures.

"11. Compel fowls to roost in the house at night, so that their roosting quarters may be free from the tick.

"12. It is not advisable to dip fowls, neither is it a fact that anything fed them will rid them of these pests.

"All of the above should do much to help in the work of eradication."

THE ROSE BUG

The common rose bug is scientifically known as *Macrodactylus subspinosus*. In sections where he is prevalent in any considerable number, great damage is often done to young chicks. In order that you may identify the beetle readily, the following description will enable you to pick him out:

He is a slender fellow, tapering before and behind and measures about three-eights of an inch in length. The body is thickly covered with fine yellow scales like hairs which give it a greenish-yellow color. The legs, six in number, are long and slender, of a pale red color. These beetles generally appear early in the summer, usually from the first to the middle of June. The adults are usually present in sufficient number to damage the chicks for a period of from four to six weeks after they make their first appearance. The beetles feed on roses, grapes, daisies and many other common plants. The eggs are laid in the ground by the females and the lava feed on the roots of plants, coming out in the adult stage the following summer. These beetles are in many sections called rose chaffers. Where these bugs are present in large numbers, chicks chase them, devour them in large quantities and the result is a dead chick the next day. Hens seem to know enough to leave the rose bugs alone, but the chicks seem less discriminating. There is just one positive preventive; namely, to keep the chicks and the rose bugs separated. This can be done by putting up a temporary fence on stakes confining the chicks to a rather restricted area adjacent to the colony or brooder houses.

It is an excellent precaution to mow the range where the chicks run and fence the chicks out of the adjacent field where there are daisies and other flowering plants. The chicks will find the rose chaffers before you yourself detect them and your first knowledge of their presence will be some dead chicks in the brooder house in the morning along about the middle of June or a little earlier. Whenever you find any dead chicks, open the crops and if you find rose bugs prevalent you will know that the next job to do above everything else is to stretch the temporary fence and confine the youngsters to a green mowed field. Professor Lamson of the Connecticut Agricultural College has found as a result of recent investigation, that the rose bugs secrete in their body a very deathly poison, a few drops of which injected into a guinea pig or rabbit, will cause instant death. In the case of chick poison, the death is not so rapid as it takes time to get the poison into the blood stream by way of or through the digestive tract. If there are any vines or shrubs near the brooder house where the rose bugs congregate, shaking them off in a large basket and later pouring kerosene on them and burning them is a good way to kill them off and thus reducing the number the next year. For every adult female killed, it means so many less eggs that will not crop out the next summer.

THE COMMON BEDBUG AND CURUCO

The human bedbug is not infrequently an important pest of poultry. When they get a start in a chicken house they breed up rapidly and by sucking the blood of the fowls and disturbing them at night cause much damage. They have been found in chicken houses in all parts of the country.

The habits of the bedbug are generally known and will not be discussed here. They remain in hiding in the roosts, nests and walls and roof during the day and attack the fowls at night. Treatment of the house and construction of roosts and nests as advised for the common mite will destroy this pest.

There is to be found in parts of semi-arid Texas, New Mexico and Arizona a bug closely resembling in appearance and habits the human bedbug, but confining its attention to poultry. It is known by the Mexican name "Curuco." Where numerous they are a serious poultry pest. The same remedies used for the bedbug will control this chicken bug.

THE STICKTIGHT FLEA

Throughout the southern half of the United States the sticktight flea is to be reckoned with as a poultry pest. It breeds most freely in regions where the soil is sandy and varies much in abundance during different years.

It is a true flea, but the legs are not strongly developed for jumping. It usually attaches itself firmly to the host and remains there for the greater part of its life, laying eggs while attached. It is usual to see the fleas in groups on the wattles, around the eyes or on the comb of chickens, or attached in masses along the edges of the ears of cats and dogs.

The young fleas hatch from the eggs which fall beneath the roosts or in the sleeping places of cats and dogs or under buildings where the fowls stay during the day. When first hatched they are very minute white maggots. These feed in the dust and finally in about thirty-five days produce fleas.

The logical procedure is to destroy the young fleas and prevent further breeding. This can be done by keeping the fowls from going beneath houses by applying wire netting, and keeping dogs and cats from sleeping in the chicken yards. Scrape up all the material in the hen houses and where the fowls and dogs have been frequenting and haul it out and scatter on the fields where the sun will kill all fleas. Sprinkle a considerable amount of cheap salt over the ground and wet the soil thoroughly. The wetting should be done two or three times at weekly intervals to destroy all the young. The fleas on the fowls will all drop off in two or three weeks without any treatment.

THE BIRD FLEA

From widely separated localities in the northern states, and especially in the Northwest, have come reports of the infestation of poultry houses with the bird or European chicken flea. This insect does not remain on the fowls as does the sticktight flea, but hides in the nests and about the building and sucks blood when opportunity offers. It appears that rarely it becomes seriously abundant.

The burning of the nest material, thorough cleaning of the poultry house and application with a spray pump of crude petroleum, or better, creosote oil, should give prompt relief.

COMBINATION OF TREATMENTS FOR DIFFERENT PESTS

In order to reduce the labor involved it is often practicable in case two or more pests are present, to combine the treatments so as to destroy the different parasites at one time.

In case lice and depluming mites are known to be present the two treatments may be combined, using the following formula for the dip:

Water	1 gallon
Soap	1 ounce
Sulphur	2 ounces
Sodium fluorid	1 ounce

If scaly leg is present along with lice it is advisable to follow the dipping of each fowl with the treatment of the legs in crude oil.

Attention should be directed to the fact that the same treatment is applicable to the common mite, the bedbug, the "curuco" and the fowl tick, though the follow-up work has to be kept up longer for the tick.

GAPE WORMS

It is a continual fight against enemies from the time the chick comes from the shell. Gape worms that fasten themselves on the trachea in order to suck the blood from the mucous lining are one of the most dangerous enemies to the young stock. They are small worms, red in color, and almost a half inch in length. They interfere with the breathing of the young bird and cause it to open its mouth and seem to gape, from which the worm gets its name. There are various methods recommended for its eradication which are made for the purpose and put on the market. It has also been recommended that lime be thrown into the coops in which the young stock is kept, which causes them to gape violently and eliminate the worms.

The best method is prevention and when you find the premises infested with the worms it should be thoroughly plowed and limed thoroughly with air slaked lime and no stock be allowed to run where the gape worms have been found. Poultrymen too often make the mistake of running the stock too long on the same soil. Good soil conditions are one of the underlying principles of success.

The worms are very plentiful just after rains as they come up from the ground at this time to be taken up by the chicks. The infection is worse after rainy spells.

If you move your chickens to fresh ground or cultivate the ground year after year and keep oats or rye or some crop growing in the yards, you will seldom, if ever, be troubled with this disease. Do not let the chicks out in the morning until the sun is up well and the earth worms have been driven into the ground if you are troubled with this disease. Keep the chicks confined to the coops in the early morning if your ground is infested with gape worms.

If poultry is raised on one piece of ground for a long period of time and the ground is not cultivated or purified, it will sooner or later become infested with gape worms, especially if the ground is low and flat. The worms may be seen attached to the walls of the windpipe of the young chicks. For treatment, move the chicks to new and well drained quarters and plow the infected areas after the ground has been covered with air slaked lime. Individual treatment necessitates the removal of the worms. This may be done by a worm extractor made especially for the purpose or by a feather moistened with turpentine which should be run down the windpipe and twisted as it is removed. Other treatments are given in the lesson on the Baby Chick.

Symptoms: Frequent gaping; coughing up worms; neck shortened or drawn up, except when extended for gaping, bird shakes its head, often convusively.

Treatment: Disinfect premises and administer

Naphthalene	grain	1
Sulphur	grains	3
Turpentine	drops	5

Flour enough to make one pill. Give twice a day until cured. It should not require more than three days' treatment to cure a bird. Another good treatment is to burn a few drops of Carbolic Acid on a hot brick and allow the bird to inhale the fumes. Other treatments are given in the lesson on Baby Chick.

INTESTINAL WORMS

The worm that works most havoc is round and large in the middle and tapers at each end. When a flock of young birds becomes infested with these parasites the vitality of much of the stock will be impaired and many will be lost. They cling to the lining of the stomach and intestines and they often eat holes through the part affected. They live on the food that is fed to the chickens and prevent the bird from getting its proper nourishment. Many of the losses will occur in the mornings. The bird not furnishing enough feed during the night in its intestines forces the worms to cling to the inner lining of the intestines, and the very life blood is sapped away. It soon dies from exhaustion.

There is a treatment that is recommended which is very laborious as each individual must be treated and when the flock is large it involves a great amount of time. You can take a catheter which is inserted into the bird's throat containing about a teaspoonful of oil of turpentine. This is given about an hour before feeding, preferably in the morning, and later follow with one teaspoonful of castor oil.

When you find infection it is better to cull out the birds that do not seem to be infected and run them on new soil. The badly infected birds will be unfit to breed from, and even if saved, should be eaten. The soil in this case should be limed and plowed and it would be better to keep the birds off for at least a year and grow some crop on the land.

The fact that we have so many poultry diseases is that so little care is exercised to keep the soil in condition. So many poultry ailments come from the soil that many failures are due to the fact that the soil is not kept sweet and clean.

Post Mortem: The parasite worms of the intestinal tract may be grouped as tapeworms, flukes, roundworms, and thorn-headed worms. On opening up

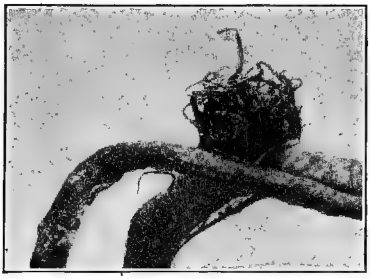
A few of the worms found in one intestine. Hundreds of worms in the intestines of a fowl can consume all the nutrition in the food eaten by the bird. The result is that the fowl gradually becomes thinner and weaker and death will result when the worms are killed.

birds that die or on killing a weak, thin bird, the intestines and ceca should be cut open and the contents mixed with water in a dark pan. Worms, if present, can be detected, as they are white and threadlike.

The large, round worm (Ascaridia perspicillum) is from 1 to 4½ inches in length, when full grown. The tapeworm (Davainea tetragona) is long, flat and segmented. Both these worms are found in the intestinal tract, where they usually cause inflammation. The caecum worm is found in the blind guts that lead from the intestine near the vent. This worm is from three-tenths to one-half an inch in length and round. A few of these are found in nearly every bird.

TRANSMISSION: The infestation is spread by either the worms or eggs being taken into the bird with food and water. The eggs are very resistant and may retain their vitality for as long as a year. It is believed that the tapeworms require another animal, such as a snail, earthworm, or slug, for partial development.

Symptoms: The birds usually become weak and dull, isolate themselves from the rest of the flock, become very thin and show signs of diarrhoea when in their last stage. The fowls should be moved to fresh ground every two or three years or else cultivate and sow your yards to grain. In cases of infection of the digestive tract by the parasitic worms, the droppings should be removed from the houses, and any parasites or their eggs destroyed which may be in them, by mixing with quick lime or saturating them with a ten per cent solution of sulphuric acid.



A portion of the intestine of a bird which shows worms accumulated in such large numbers that they have broken through the walls of the intestine and a great ball of them is shown in the opening.

CONTROL: The method of treatment of a flock is as follows:

1. Use fresh ground for raising chicks. Remove or plow up the ground around houses and sow down.
2. Fill up mud-holes and improve drainage about buildings.
3. The following mixture is suggested:

Santonin	2⅛ grains
Calomel	2½ grains
Aloin	2½ grains
Arecanut	10 grains

This can either be fed in a dry mash, moistened with some liquid, or can be fed in capsules to individual birds. For flock treatment, feed in a moistened mash. One or two treatments is all that should be necessary. Do not feed more than TWO GRAINS of mixture to each individual bird. Capsules can be made up by a druggist.

4. A tonic can be made by mixing 12 quarts of mash with 1 pound Epsom salts to 1 pound dry powdered sulphur. Give all that they will clean up in 10 to 15 minutes every day for three or four feedings.

Treatment: When treating diseased birds, these should always be isolated and confined. For treatment of roundworms, the following is recommended: Dissolve in the water, which is to be used for mixing the mash, two grains of santonine for each bird to be treated. Mix a small amount of mash and add one-half teaspoonful of castor oil for each bird. For tapeworm, Dr. Salmon recommends the following: Mix in the feed a teaspoonful of powdered pomegranate root bark for every fifty head of birds. Also treat the yards with lime.

Remove the droppings daily from the house and keep some quick lime on the droppings board. Dissolve in the water which is used for mixing the mash, one teaspoonful of Epsom salts to each bird which is to be treated. Then give a two grain Santonine and a two grain Calomel tablet. Keep all food away from them while giving the salts and the Santonine. The next day it is a very good idea to follow this with a half teaspoonful of Castor Oil for each bird. Repeat the above treatment in three days if the birds are badly affected.

"GOING LIGHT" OFTEN CAUSED BY INTESTINAL WORMS

We have found that many cases of birds "going light," so-called, was caused by intestinal worms. Especially is this true with late hatched chicks. The worms increase in such numbers that they sap the nutrition from the blood and the vitality from the fowl. The result is that the bird becomes very thin, practically nothing but a mass of skin, bones and feathers.

We give below one of the best treatments for this trouble that we have ever used. In case you have birds which "go light," we advise that you first try this treatment.

The ultimate strength and vitality of a fowl depends upon the cleanliness and the healthfulness of the organs through which the food passes on its journey through the body of the fowl. If injury should occur to the delicate cells which line the organs of digestion and absorption, the physical condition is affected and vitality is lowered which eventually means sickness and disease. Roup, canker and even the dread scourge of white diarrhea may take hold of the fowls, especially those of lowered vitality, with the result that loss follows:

The small cells lining the organs of digestion and absorption, especially those cells lining the intestines, are often ruptured to a very marked degree by the presence of worms. Ruptured cells mean the loss of the function of the cells. That is, the cells are not able to perform their duties, to secrete juices which digest the food, and consequently a large amount of the food infested with worms do not derive the full nutrient value of the food. If eaten is not utilized by the fowl. It follows then that birds which are worms are present they have to be fed and the food thus eaten is fed at the expense of the fowl. It is easily seen that from every standpoint, the presence of worms is a losing proposition.

Healthy poultry, both inside and out, are able to ward off to a very marked degree the action of bacteria or bacterial poisons. Weakened poultry are not able to withstand or ward off the action of bacteria or bacterial poisons and consequently suffer.

When it is pointed out that there are no fewer than thirty-six (36) species of worms living as parasites within fowls, it will be seen that these parasites are injurious to the fowls. Worms may develop directly from the eggs of the worms or they may go through various and complicated changes. They are found in every conceivable locality.

The general health and physical condition of a fowl may be judged to a certain extent by observing carefully the color of the bird's comb, eyes, wattles, etc., but birds apparently in the best of health may have worms in their intestines in small numbers and after a while, owing to the growth of these worms, the physical condition of the bird will change. The bird that was apparently in the best of health is soon on the sick list. It may take weeks or even months before a change in the physical condition of the bird becomes apparent, but once the worms gain the upper hand, the birds become subject to colds, and colds becoming deep seated, the loss of, the bird is sure to follow.

In view of these facts, it is advisable and strongly recommended that the fowls should be given a thorough cleansing out before being placed in winter quarters. Where individual treatment cannot be resorted to, the flock may be treated in the following manner:

Measure out just enough mash, all that the fowls will thoroughly clean up at one time. Moisten the mash with water and add to the mash one teaspoonful of Oil of American Wormseed (Jerusalem Oak) and one teaspoonful of turpentine, for every twelve fowls. Mix the ingredients thoroughly.

Before feeding the mash, the birds should be starved for at least twelve hours. We recommend feeding a light ration the night before and then in the morning no difficulty will be experienced in having the fowls eat the treated mash. Ordinarily, if the fowls are not very hungry, they will not eat the mash, for the taste of oil of wormseed and the turpentine is not pleasant. Feed the treated mash again in the evening of the same day. On the morning of second day a dose of Epsom salts should be given. The salts may be given in a mash. Dissolve six (6) teaspoonfuls of Epsom salts for every twelve fowls in just enough water to moisten the mash. The amount of mash used varies according to the breed of fowls and to the individual attendant. Moisten the mash with this water and then feed.

It is essential that the birds have before them plenty of clean, fresh water at all times.

This treatment as outlined is for adult fowls. Proportionately less of the materials must be used for the young stock. If there are only a few birds needing treatment, the following is recommended:

A paste is made up as follows:

Two (2) parts charcoal, by weight.
One (1) part turpentine.
One (1) part Oil American Wormseed or Jerusalem Oak.

Two four-grain (4-grain) capsules are given to each fowl for two successive nights and on the following morning four-fifths (4-5) of a teaspoonful of Epsom salts in sufficient water to dissolve the salts is administered. (Rather than use the salts, we prefer to give two four-grain capsules filled with powdered rhubarb and two four-grain capsules filled with common baking soda.)

EXTERMINATION OF WORMS WITH TOBACCO

Round worms are intestinal parasites of poultry that are causing an enormous annual loss to poultrymen from decreased egg production and high percentage of mortality in the flocks.

Many of our students use and recommend the tobacco treatment for intestinal worms. We have used it with very satisfactory results. The fowls do not seem to mind the taste and eat as much as ever. This is given to the pullets when put in laying house and we are never troubled again.

Experiments demonstrated that tobacco dust fed in the dry mash is an effective remedy for round worms. No harmful effects on the birds have been found. Its use has caused no decrease whatever in the egg yield of the flocks. On the contrary, an immediate and constant improvement in the condition of the infected birds has resulted in increased egg yield. The birds do not seem to detect the presence of tobacco dust in the mash, and therefore relish it and consume their usual quantity without the necessity of applying starvation measures. The use of tobacco dust is recommended in flocks that are known to have round worms.

Tobacco dust should be fed in the mash daily for a period of at least six weeks.

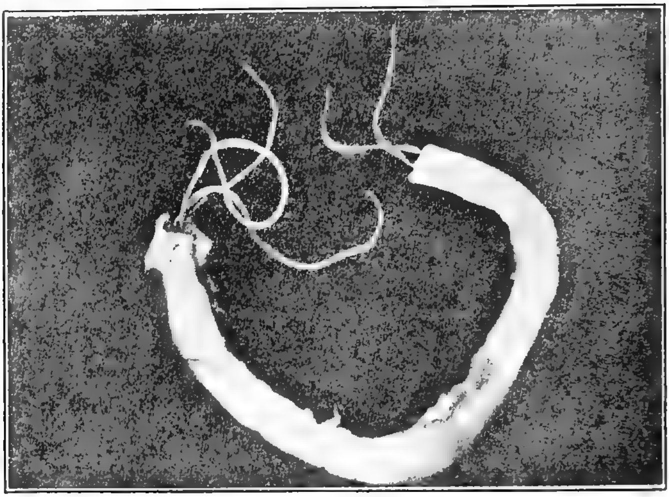
And not only is tobacco dust effective where fowls are known to be infested with worms already, but successful poultrymen use it as a preventive. They begin on chickens three months old, giving one pound to each thousand birds daily for three months, mixing it in the dry mash.

Poultry supply dealers and seedmen have the powdered tobacco. Poultrymen wishing to try this remedy should be sure to get ground tobacco and not ground tobacco stems.

Get rid of the worms and allow the fowl its full strength and vitality to produce growth and size and to lay eggs. Some of the agricultural colleges have found the tobacco treatment effective.

Extensive investigations by the California Agricultural Experiment Station at the University Farm have shown that tobacco dust is one of the most effective and economical remedies which can be used for expelling round worms.

Tobacco dust is administered in the following manner: To each 49 pounds of dry mash add 1 pound of tobacco dust and mix thoroughly. Feed this dry mixture to the birds in place of the mash that is being used. Except for the addition of the tobacco dust no change whatever is reequired in the method of feeding, provided that method has proven satisfactory. Continue feeding the tobacco daily for about one month. By this time the worms should be expelled and the birds in healthy condition again. If not, continue the tobacco dust for one to four weeks more. Since there is no practical method for destroying worm eggs in the soil, birds, especially young stock, kept in badly contaminated yards, are liable to become infested again after a time and it will be necessary to repeat the treatment. The feeding of the tobacco dust, as recommended, will not in any way affect the continued health and egg production of poultry, whereas the ravages of intestinal worms, if unchecked, will soon break down the health of the flock and result in heavy mortality.



Roundworms protruding from section of intestine.

It is desirable to tack 2-inch mesh netting on under side of roosts so as to enclose droppings board beneath roosts to prevent fowls eating, next morning, the worms passed in the droppings during the night; wire netting can be so arranged as to permit of raising roosts hinged at rear so droppings board can be easily cleaned. As you perhaps know, fowls will pick these worms out of the droppings and eat them again, so that the trouble is not remedied when this occurs."

Prof. Geo. R. Shoup of the Western Washington Experiment Station, states that "for treating worms it is advisable to thoroughly administer the tobacco treatment to young pullets when six to eight weeks old."

LIQUID TOBACCO TREATMENT

DOSE.—One pound ground or finely chopped tobacco stems to 100 birds.

Steep tobacco two hours in enough water to keep well covered. Mix into 4 quarts of mash, using both tobacco and liquor. Feed wet, between 2 and 3 p. m., to birds fasted since previous day.

Two hours later feed one pound Epsom salts dissolved in water and mixed into three quarts of mash, taking care that each bird gets its share.

Remove droppings at daylight, or protect with wire to prevent reinfection.

Two treatments, a week apart, expel practically all worms.

CLEANING FLOORS AND YARDS

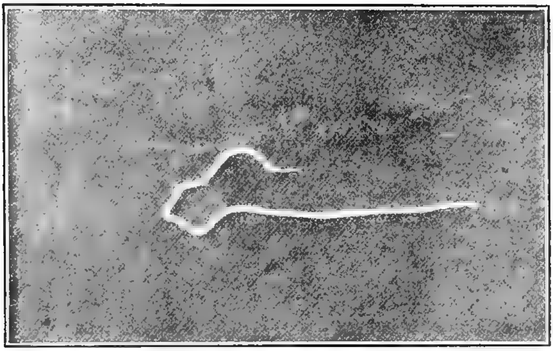
After treatment, adult fowls might well be confined to the house, which should be cleaned, disinfected and provided with new litter. If yards are used, in order to prevent reinfection, they must be free from living worm eggs, which means either new or chemically treated yards. Lime and ploughing are not sufficient. Bichloride of mercury (corrosive sublimate) one ounce to eight gallons of water, has proven most effective. Loose filth is first removed and the ground thoroughly soaked with the bichloride solution. Manure from infected flocks should not be applied to land upon which chickens run.

Inasmuch as growing chickens are more seriously affected than mature stock, great caution is necessary with brooder chicks on infected plants. The runs of permanent brooder houses should be soaked with bichloride of mercury solution, using about one gallon to each ten square feet of area, and, when old enough, the chickens removed to clean rearing grounds. Care should also be taken to prevent infection being carried in from other yards or buildings on the feet of attendants or by other means.

One of the most effective methods of ridding fowls of intestinal worms is that recommended in our disease lesson. You can sometimes rid your flock by that method when nothing else will do, so try the method recommended in that lesson.

TAPEWORMS

Tapeworms are also very injurious. The use of turpentine and oil is also good for these parasites. Pomegranate bark is also used. Give one teaspoonful in the mash to fifty birds.



The tapeworm that saps the vitality of fowls.

Treatment: Disinfect premises and do not feed for 24 hours. Administer the following:

Naphtha	grains 5
Turpentine	teaspoonful 1
Nujol (Standard Oil Co.)	teaspoonful 1

Mix and give in one dose. Two hours after this treatment give one large teaspoonful of Epsom Salts (not Castor Oil). One treatment will expel the tapeworm.

ROUND WORMS

Treatment: Disinfect premises, especially droppings board, spade up runs, and administer

Naphthalene	grains 3
Camphorated Oil	teaspoonful ½
Turpentine	teaspoonful 1

Give in two doses two hours apart, following with 1 teaspoonful of Epsom Salts (not Castor Oil). The above is the surest formula for the purpose. There are many drugs that will expel worms, such as Areca, Pomegranate and Thymol, but are very uncertain. However, Santonine is a high-class remedy. If Santonine can be procured, we suggest that you give each bird 2 grains, with Calomel ¼ grain instead of the above formula.

QUESTIONS ON ENEMIES AND PARASITES

1. How are flocks infested with parasites?
2. How does the louse injure poultry?
   What is the difference in the habits of mites and lice?
3. How would you destroy the lice if the young stock should be infested?
4. Which furnishes the best feeding ground for insects, the healthy or weak fowl? Why?
5. Name a good formula for making insect powder.
6. What is scaly leg, and what is a good treatment?
7. What is one of the best methods of exterminating rats?
8. For what is Sodium Fluorid recommended, and how is it used?
9. What is a depluming mite? How would you rid your birds of them?
10. Discuss the effects and habits of the intestinal worm.

THE END

POULTRY DISEASES
Their Cause, Prevention and Cure

By T. E. QUISENBERRY

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The poultry industry has outgrown its swaddling clothes and towers as a giant among the agricultural pursuits of the world. It is not today a mere side issue, but has become one of the specialty lines of farm pursuits. Exclusive poultry farms are being established rapidly, with greater promise than ever before of success, because of the progress that science has made in combating disease. So great is the importance of poultry work that many States are supporting poultry departments for research, that the causes of disease and methods of combating them may be found.

No doubt you have heard of Lady Show You, the bird that sold for eight hundred dollars. If Lady Show You should catch a cold or contract disease of any kind, that would be of some concern to the owner. The increasing value of birds has led to greater interest in trying to ascertain the cause of disease and the methods of combating it. Poultrymen, however, are following the leadership of the modern physician, who is laying greater stress upon preventive methods than upon faith in curative agencies.

Fowls, like men, have become heir to more diseases under civilizing agencies than when they roamed the wilds and made their own way. The man who argues that the farm fowl that roosts in the trees and hunts its own way has more vigor than the pampered bird, has the better of the argument. That type never produced a Lady Show You, or a bird like her, however. They have maximum health, but give minimum results in egg production.

Modern methods have brought disease. Fowls have the gout, rheumatism, colds, pneumonia, tuberculosis and many of the diseases that civilized man has, and new diseases are constantly appearing that baffle poultrymen. The interchange of birds through the country scatters disease, and it is not often that trouble is localized, as it soon becomes a problem for the entire poultry world.

In breeding for high egg production or show qualities it is well to build for health and vigor at the same time and not permit disease to make inroads into your flock. The time is at hand when we should devote more attention to the scientific study of poultry diseases and breed vigor into the flock, not disease. It is important that the veterinarian should know something of poultry diseases, that the poultrymen may have a specialist to treat his fine birds or to give professional advice in handling of his flock. The place to study poultry diseases with a view to finding methods of combating and curing them is the Experiment Station. It is the duty of every farmer and every professional poultryman to learn to diagnose disease and the methods of treatment. It is well to learn how to make post-mortem examinations in order to furnish to your Station or the Federal department at Washington a description of the disease that was the cause of the death of the birds. We illustrate to you how to do this, so that if you are not familiar with the trouble you will be able to give a more detailed description of the disease that caused the death of your bird than is ordinarily given in letters to the stations.

In many cases by using this book as a guide you will be able to find the trouble, diagnose the disease and then apply the remedy.

PREVENTION RATHER THAN CURE

You should aim to prevent the occurrence of disease rather than to cure it. Unless the fowl be a valuable specimen, it seldom pays to doctor it, for any really serious ailment. It is all right to give treatment when beneficial results can be obtained by applying treatment to the whole flock, but otherwise it seldom pays. A cured chicken is a menace to the flock and its weakness is more or less certain to appear in the offspring.

Wright sums up this point very well as follows: "In a large proportion of cases of disease, the birds ought to die or to be killed. Even where there is no constitutional taint, the fact that they have succumbed to circumstances which have not affected others, marks them as the weakest, which, unaided, nature would assuredly weed out, and which, if we preserve and breed from, would perpetuate some amount of that weakness in the progeny. Rheumatism, for instance, can be cured; of that there is no doubt. But the vast majority who have had such success agree that the effects are either never recovered from, or retards strength and vigor, or else that the original weakness continues; and the same may be said of some severe contagious diseases, such as diphtheretic roup, which may affect the strongest. On the other hand, many diseases also apparently contagious, and so attacking healthy birds under certain predisposing conditions of exposure or other coincident strain upon the system, do not appear to leave serious results behind them, and are quite definite in symptoms and character. It is these which may be most successfully treated, and in which treatment is most worth while where fowls of value are concerned. But it is significant that nearly all breeders who raise really large numbers of poultry gradually come to the conclusion that with valuable birds the most economic treatment of serious diseases occurring in a yard, except in specific cases, is execution. A sick bird indcates that something is wrong, so treatment of the flock should begin at once."

THE ESSENTIALS TOWARD PREVENTION

You may sum up the essentials of poultry hygiene as follows:

1. Clean up.
2. Clean out.
3. Clean houses.
4. Clean air.
5. Clean food.
6. Clean water.
7. Clean yards and clean range.
8. Clean incubators and brooders.
9. Clean birds outside and inside.

A GREAT PREVENTIVE

You can keep your birds in a healthier state and prevent many diseases if you will keep their systems cleaned out by giving one-third to one-half teaspoonful of Epsom salts to each bird every month. We dissolve the salts in water and moisten a mash made of bran, middlings, and cornmeal, with the water containing the salts. During the breeding season we give the salts once every two weeks. This method will add much to the general health of your flock, and we advise all farmers and poultrymen not to neglect this important preventive.

HOW MUCH EPSOM SALTS TO GIVE CHICKENS

For chicks from one to five weeks old, one level teaspoonful to eight chicks.

For chicks from five to ten weeks old, one level teaspoonful to five chicks.

For chicks from ten to fifteen weeks old, one level teaspoonful to three chicks.

For chicks from fifteen to twenty-six weeks old, one level teaspoonful to two chicks.

For adult fowls, as a preventive, one-half to three-fourths of a teaspoonful each every two weeks.

For adult fowls, as a cure, three-fourths of a teaspoonful each.

Salts may be given most conveniently when dissolved in water and mixed with a little mash.

It is best to starve the fowls for about one or two meals before feeding the salts.

TRAIN YOUR EYE TO DETECT DISEASES

One of the worst troubles of many who assert that they are expert poultrymen, and who are apparently very careful and very much interested in their work, is that they are unable to detect disease in its first symptoms, the time when it is most easily overcome and remedied. We find that a very small per cent of poultry raisers are able to detect disease in its first form, and they do not know, or fail to realize, when the birds first show symptoms of being out of condition. Any one can readily tell that something is wrong when one eye of the bird is swollen shut, when it is unable to walk or when its feathers are soiled by a bloody diarrhea discharge. The real poultryman will discover these troubles in time and will attempt to remedy them long before the birds reach this unfortunate condition. Segregation of the sick fowls before they have had an opportunity to spread the contagion among the whole flock will be his aim. If you desire to succeed as a poultryman, it will pay you to train your eye to detect disease and to know when your fowls show the least sign of being out of condition.

A sick fowl usually sits humped up, with its head and neck drawn back close to its body or down into its feathers. It remains quiet and does not move about unless disturbed and then moves slowly or unnatural. The feathers are usually ruffed up and stand out from the body. The eyes are often closed and present a sleepy appearance. The comb and wattles will either be dark or very pale. If the bird shows any of these symptoms, examine it, and either isolate it or keep your eye on it for future developments.

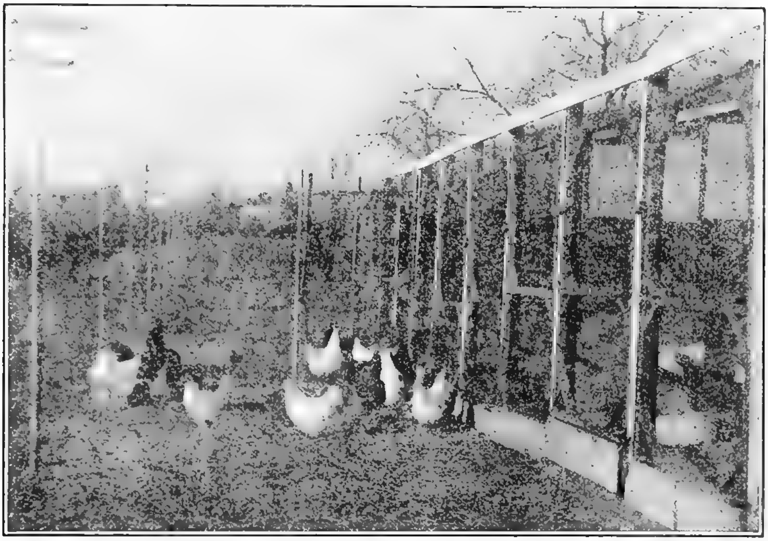

Fig. 1.

A view of a hospital and a pen of healthy birds which were compelled to live in front of it for a period of several months to ascertain whether or not they would contract any of the diseases.

Above is a picture of the hospital and the attendant's passageway in front, which is on the south side of the hospital. The straw, or litter, from the sick birds is scratched out at the front from each room or ward into this passageway.

Ten healthy, vigorous hens and one cockerel were allowed to run in this space in front of the hospital. The litter which came from the sick birds was their favorite scratching place. They were kept there for three months with no sign of contracting any of the diseases.

The reason was, no doubt, that the rooms faced the south and received an abundance of sunlight and fresh air, which destroyed the disease germs. So we believe that Nature's own remedy and preventive should be made use of by every poultryman. The *importance* and the *value* of fresh air and sunlight are recognized by all medical authorities. Disease germs cannot live long where these two atmospheric conditions exist. This, with a good healthy, vigorous flock, strong in natural immunity, will do more towards eliminating diseases than all the medical assistance one can give.

BREEDING AND HEALTH

We know of no sounder advice on this subject than that contained in an article of Dr. Prince T. Woods, in the American Poultry Journal, as follows:

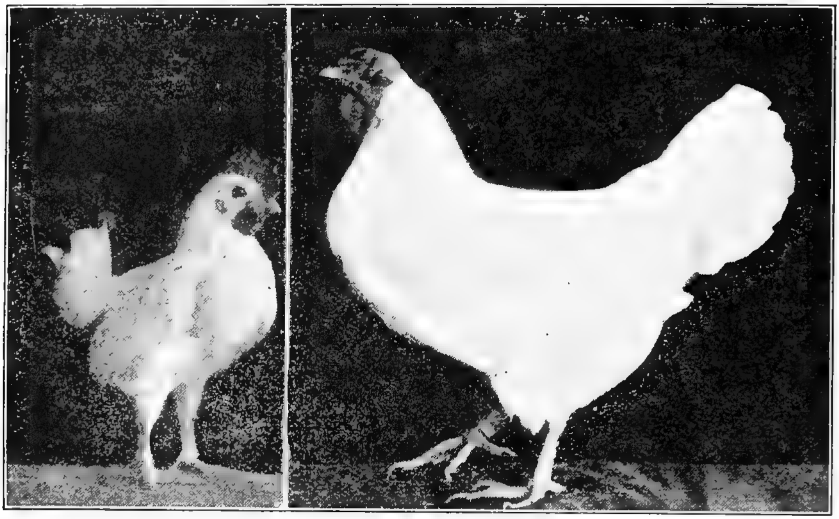

Fig. 2.

A hen of high vitality and her seven-weeks-old son of high vitality that crowed at seven weeks of age.

"THE HEALTH TYPE.—For all practical purposes, the type of health and strength and the type of weakness, of lacking bodily vigor, are easily differentiated. Do not mistake the purely nervous energy of closely bred thoroughbreds for an indication of vigor. This may be simply the mettlesome spirit of the thoroughbred, and combined with satisfactory physical qualities it is a desirable asset."

"CHOOSING THE MALE BIRD.—Always bear in mind that the male bird is half of the flock. The male should be a fully matured, well developed specimen, neither too old nor too young. A male bird from twelve months to two and one-half years old usually makes the best breeder. He should be of sound, healthy parents and should, as far as possible, inherit from them the qualities which are desired for chicks of his get. He should be particularly strong in all points of physical vigor and of standard requirements, where his mates show any traces of weakness. Have him as nearly perfect in standard shape as possible, of medium size and weight for the variety. Too heavy males often seriously injure their mates and are not desirable in the breeding pen.

"The head should be rather large, broad and of good shape, well carried. The eye should be bright, round and full, with no irregularities in shape of pupil. The comb, face and wattles should be a good, healthy color, neither too pale nor too dark. The beak should be rather short, stout and set well at the base. The long flattened beak of the 'crow-headed' birds or the misshapen 'hawk bill' are almost certain signs of physical weakness. The neck should be of medium length for the variety and rather full; the long, thin, 'scrawny' neck goes with the 'crow-head.'

"The body should be well filled out and carried in the well-set-up manner indicative of a well-ordered system of nutrition—a good digestion. The plumage should be bright, lustrous and carried rather close for the variety.

"Mopy, dopy, loosely feather birds with dull plumage and a listless 'don't care for life' manner are too short on good health to be of value as breeding stock.

"The legs should be medium short for the variety, strong and rather large boned and set well apart. The keel bone should be firm and straight. There should be no deformities.

"Leggy birds, knock-kneed and with crooked breastbones, are always lacking in physical vigor even if it does not show on the surface.

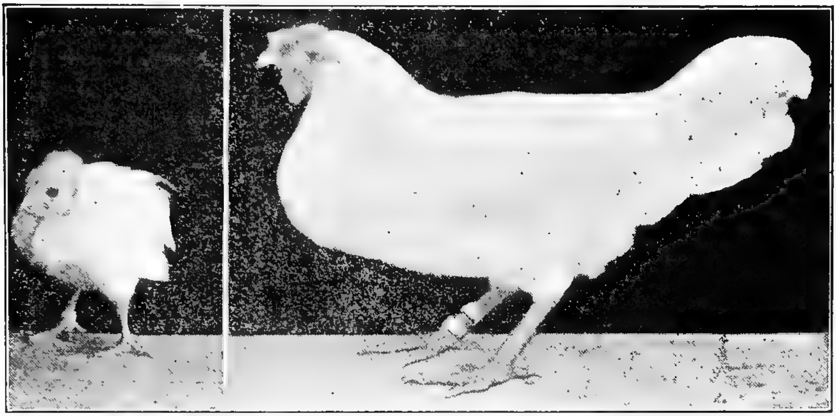

Fig. 3.
A hen of low vitality and her seven-weeks-old son that never lived to crow.

"The male should be attentive and gallant to his mates; should have a clear, lusty crow, free from any rattle at the end. He should be sound in wind and able to fight or run without shortness of breath or livid appearance of face and comb."

In selecting the profitable birds be sure to choose those with short toenails as they are the active, industrious, energetic birds which are always busy and keep their nails worn off. No. 1 shows an active, energetic hen which laid 217 eggs in one year, while No. 2 laid only 13. Note the difference in the nails.

CURED BIRDS WHICH ARE GOOD FOR FUTURE USE

There are some diseases which, if contracted by a bird, will prevent the bird's usefulness in a breeding pen, but in other cases the bird may be used if it recovers properly.

Birds which have had roup, tuberculosis or white diarrhea should never be permitted to enter a breeding pen, while birds with slight colds, or mild cases of chickenpox and canker, or bumble foot or other troubles which do not impair the vitality of the specimen can be used as breeders. Birds which have frozen combs, broken shanks, broken wings, etc., are good to use in a breeding pen if they have recovered properly.

The diseases mentioned may not be transmitted from parent to offspring, yet they indicate a weakness. If a bird happens to get a leg broken and recovers rapidly, without other complications setting in, the indications are that it has constitutional vigor. If the bird is good in other points, the fact that the leg was broken need not prevent its being used in your best breeding pens.

DAMPNESS SHOULD BE AVOIDED

A chicken cannot sweat, as it has no sweat glands in the skin, so most of the moisture has to be carried out through the breath. The amount of moisture the breath is able to carry off depends upon the amount there is in the air when taken into the lungs. For this reason, if no other, the poultry house should not be in a low, damp, foggy place. The fact that a bird cannot sweat and is forced to pass moisture off through the breath sometimes overtaxes the respiratory organs and makes the bird more susceptible to colds and roup.

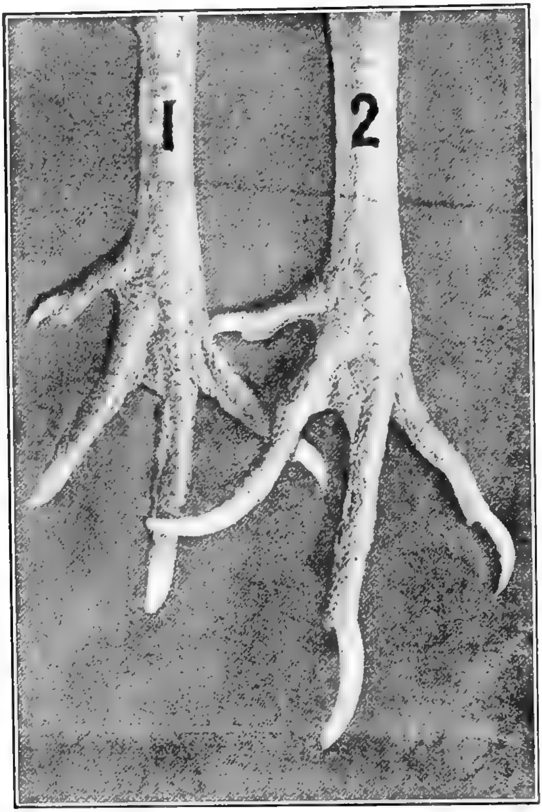

Fig. 4.

No. 1.—Foot from hen of high vitality; laid 217 eggs in one year. Note the short toenails, worn by activity of hen. No. 2.—Foot from hen of low vitality; laid 13 eggs in one year. Note the long toenails. Hen was inactive.

Dampness should be avoided. We find that a great many of the complaints and inquiries about disease which come to us are the direct result of fowls being kept in damp houses that are situated in low, flat, damp places. The house should be on a well-drained piece of land and should have sufficient foundation to raise the floor higher than the ground.

During rainy weather chickens like to get off the ground by flying to the woodpile, the fence, a pile of brush, or anything of similar nature which is off the ground. It is a good scheme to build an outside rest and shade combined. You can do this by using several poles placed closely together about three feet above the ground, just as if you were making a floor.

POULTRY HOUSES

A chicken spends more than half of its time in the poultry house, so of course the house is very important and has a great influence upon the health of the bird. Some of the points to be looked after closely are location, size, ventilation, lighting and sanitation.

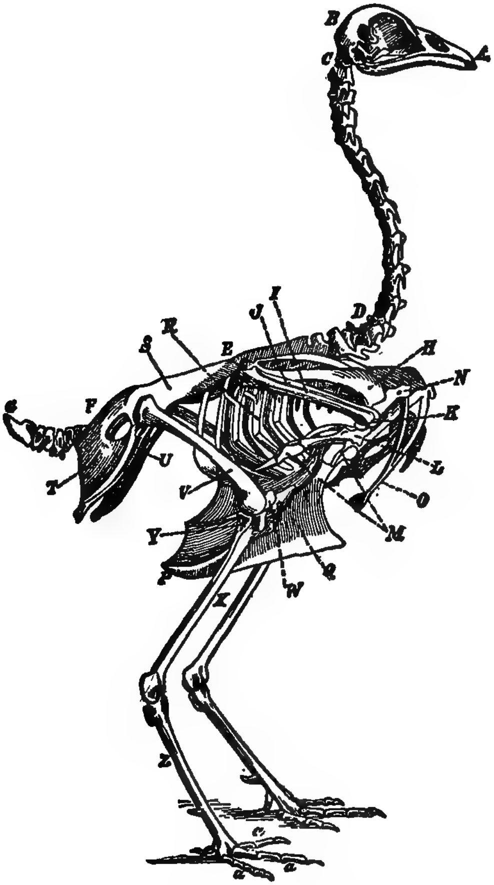

Fig. 5.

A, beak and jaws; B. skull; C to D, neck vertebrae; EE, backbone and ribs; F, acetabulum; G, pygostyle or tail bones; H. humerus; I, ulna; J, radius; K and L, bones of forewing; M, digits; N, scapula; O, clavicles (wish bone); P, breastbone or sternum; T and U, ischium and the extreme points of this bone are called the pelvic bones, or lay bones; V, femur; X, tinia; Z, tarsometartarus; a a, toes.

LOCATION.—The proper location of the poultry house is of prime importance. No matter how good your house may be, if it is in a low, damp place, where the ward surrounding it is wet and the land sour, your house cannot overcome all of these evils. It should be placed upon high, well-drained ground. We prefer sandy, gravelly or light porous soil. Heavy clay soils should be avoided. They are hard to keep in a sanitary condition. If the ground does not drain well, do not erect a poultry house on it until you have provided for under-drainage by means of tile or open ditches. Water should never be allowed to stand in the poultry yards. A wet soil is colder than a dry one. Muddy feet cause dirty eggs, and dirty eggs must be washed, which lowers the price. Dampness breeds colds, catarrh, roup, rheumatism, pneumonia and tuberculosis. Air drainage is also very important.

Never locate the poultry house in a low, flat place where the air is always damp. Face the house to the south and, if possible, protect it on the north and west by trees, which act as a wind-break. The ground on which the house is situated should slope to the south or east.

VENTILATION.—A bird's normal temperature ranges from 106 to 107.5 degrees. In order to maintain this high temperature it is necessary to have an abundant supply of oxygen. Where there is so much combustion there is a great waste to be carried out through the breath. Hence the necessity for supplying plenty of fresh air.

Modern poultrymen have abandoned the old idea of supplying both light and air by means of glass windows. Glass windows admit light and keep out the rain and snow, while the best ventilator is made of slats sloping at about an angle of forty-five degrees, as in the cupolas of barns or the old-time window shutters, which admit air but exclude rain and snow.

LIGHT.—The house should be so arranged that sunlight will reach nearly all parts of the floor. Light and sunlight are the best disease exterminators, as the direct rays of the sun kill most disease germs. Do not make the error of putting in a great many glass windows in the poultry house and make no provision for the heat getting out. Too much glass is as bad as not enough. It makes a house cold at night and hot in the daytime.

There should be no dark corners. The hens always scratch from the light toward the dark, so they can see their food, and if there are dark corners they will bank the litter in these dark places, where it molds and forms an excellent place for disease germs to gather.

Sanitation is of great importance, and in order to keep the poultry house sanitary, bear this in mind when constructing a poultry house, as it is one of the most important points. Make it as simple as possible, so that it can be cleaned out and disinfected thoroughly without having to move so many boxes, barrels, boards and rubbish of all kinds.

CLEANLINESS.—"Cleanliness is next to godliness" in all things, and applies to poultry as well as anything else. But CLEAN in this case does not mean free from dirt or soil; for on the soil is the real home of the chicken; yet it should be free from disease and contaminated filth of whatever nature.

Some who will pay little or no attention to the cleanliness of their houses, brooders, incubators, etc., do succeed for a time, but depend upon it, their days of success are numbered. See that everything is subjected to a thorough cleaning and disinfection at least two or three times a year. By thoroughly cleaning we mean to clean out the litter, to shovel out the dirt and droppings, then to sweep the floors, walls and ceiling. We also like to have the nests, roost poles, feed boxes and hoppers so arranged that they may be removed from the houses, thoroughly cleaned, and new nests made before replacing. If you have a water hose convenient, turn it upon the floor, walls and ceiling and loosen all dirt. Take your shovel or hoe, scrape this all from the floor and again turn the water on. Let the house dry out for a day or two, then sprinkle the floor and walls with a solution of some disinfectant like zenoleum, creolin, etc. The nests and roost poles should be similarly treated. If there has been any disease in the house we would advise the application of the disinfectant the second time before putting the birds in. Keep the roost poles painted with a liquid lice killer or with some of your own make. Use one part crude carbolic acid and two parts kerosene.

HOUSING

The right sort of housing is absolutely necessary. If your houses are wrong, you have trouble to begin with. Your houses must be dry, comfortable, well ventilated and well lighted. Without these essentials, you are certain to have more or less trouble with disease and you are certain to become discouraged sooner or later.

THE FEEDS

The condition of any animal depends greatly upon the quantity and quality of the food it eats.

The different tissues of the hen's body require different elements to keep that particular tissue properly nourished. If an animal eats to excess any one food, it gorges that particular tissue of the body while another part is lacking. In such cases, both parts are weakened and subject to disease. Over-feeding is almost as bad as under-feeding. Over-fat birds are as subject to disease as are poor birds. If the feed ration is properly balanced and properly fed there will be no danger of either condition mentioned.

CLEAN LITTER

The old saying that "a busy hen is a laying hen" should be reversed to read "a laying hen is always busy." Clean litter should be provided for the scratching shed, so the hens may scratch whenever they wish. Musty, dirty or moldy straw should not be used, nor straw that is ground up too fine, as the hens in picking out the grain in very fine litter are apt to eat so much fiber that it cannot pass from the crop to the gizzard. This is one of the causes of crop-bound. Some molds are very injurious to the health of chickens, so we should be careful about allowing the litter to get moldy.

HOPPERS AND FEED TROUGHS

A hen always supplies her bodily needs before she provides a surplus to form eggs. In order to supply food for the body and a surplus for eggs it must be worked into digestible form by the digestive organs. It is of vital importance that the food be clean, wholesome, nourishing and free from disease. It is a bad practice to feed chickens on disease-infected ground. It is far better to have a trough or feed hopper, which can be scalded when necessary.

Feed hoppers and drinking fountains are as necessary for small chicks as for large ones. They should be arranged so the chicks will not get into them, as they will contaminate both feed and water, besides getting wet.

FEEDING

The methods of feeding have as much to do with the health of the flock as the kinds of feed. In order that a chicken may be in the best of health it should be a continuous eater; in other words, eat small quantities often instead of eating a large quantity, then wait some time and eat more. The stomach of a fowl is small compared with the quantity of food consumed. As the food passes from the crop to the gizzard it receives the gastric juices from the stomach (or proventriculus). If the food is hurried through this part of the digestive tract it does not receive enough of the gastric juice, so the process of digestion is incomplete.

If fed by the hopper method or in troughs, there is not so much danger of contamination as if fed on the ground. Never feed a wet mash on the ground floor of a poultry house. And never feed more wet mash at any one time than the birds will clean up, as it will sour and probably cause indigestion.

NECESSITY FOR THE STUDY OF DISEASES

He who says he can always detect diseases by sight and smell has overestimated his ability. The microscope will tell very closely, but, even then, you may have two diseases combined. The thing to do is to treat the chicken and place it in quarantine. Don't place it in with other sick chickens suffering from a different disease.

The general chicken raiser, and even the men at the head of large poultry farms, have been careless in regard to getting down to a system in studying diseases. Take the chickens that die and place them on a board, open them and learn all you can about them. You can save others by so doing. You can give more intelligent history to the bacteriological and pathological laboratories, and they in turn can help you stamp out the disease. Furthermore, there is no reason why you, yourself, should not find out something new that would be a help to the poultry world. If every farmer or poultry raiser would post all chickens that die and report the causes of death to the experiment staitons we would find, in the first place, what diseases were causing the greatest loss of poultry. In some cases we would find out why, and how to stop it.

This is not all done easily, but it is done slowly and by good hard work; and there is some little danger to yourself by carelessness in handling these birds. Some poultry diseases are infectious to man. For that reason your attention is directed to the fact that in treating roup and canker you should be careful. Germ diseases are like electricity—the better you know how to handle them the more harmless they are. Disinfect your hands after handling sick birds. Do not breathe directly over the mouth of a sick bird. Wear an old coat when handling diseased birds, and hang it in the sun when through with it. Formerly that was all that was done by physicians when caring for contagious diseases. Today we have in addition more of the vaccines to protect man from diseases. As the poultry industry grows and the people learn the importance of it, and the value of the high scoring birds, the more the fowls will be treated for disease. Protection and prevention will be the treatment.

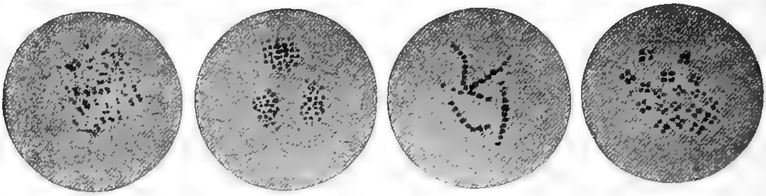

Fig. 6.

Bacteria as seen by the microscope. From left to right they are as follows: Diplococci, Staphylococci, Steptococci, Tetrads.

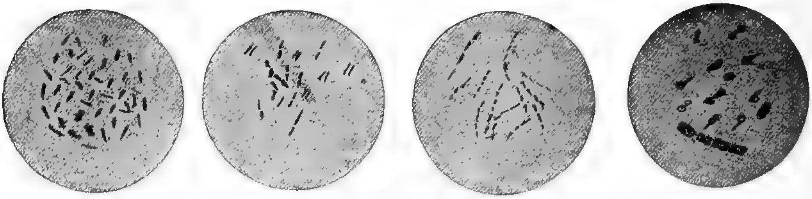

Fig. 7.

Bacteria as seen by the microscope. From left to right they are as follows: Single Bacilli, Dipo-bacilli in pairs, Strepto bacilli or threads, Spores.

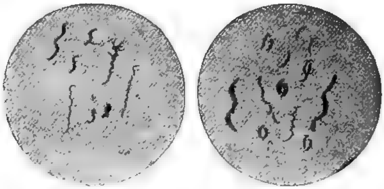

Fig. 8.

Bacteria as seen by the Microscope. Both are Spirillum.

THE BATTLE OF CELLS AND GERMS

There is a constant battle of the germs of the body and germ life, either directly by the germ entering or trying to enter and live in the cell or indirectly by germs producing poisons, and these poisons tend to break down the protoplasm that forms the cell. Yet we must not think that all germs or bacteria or microbes are detrimental to cell life. In fact, the greater number of bacteria are a benefit and aid plant life in its growth, and then aid in transforming plant life into animal food. The pathogenic bacteria and germs are the ones which produce disease and break down the cells.

The blood, in the first place, comes to the aid of the body cells in fighting disease germs and their toxins. It is the white blood corpuscles which are called the scavengers of the body. They take up bacteria in the blood stream or pass out of the blood vessels and there take up bacteria and die or may pass back into the blood stream again and are carried away through some other organ. The composition of the blood serum itself has a certain neutralizing power for bacteria toxins and even disintegrates bacteria. The latter condition is aided by antitoxins and vaccines. Individuals once having had certain diseases are immune to them. This is true only in a few cases. How far this fact may be carried in poultry diseases is, as yet, unknown. The blood tests that are now being made will soon, we hope, determine the resisting power of the blood in fowls.

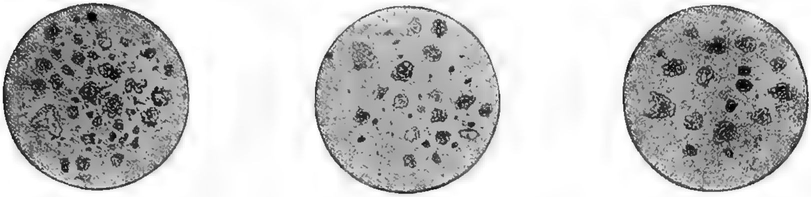

Fig. 9.
Colonies of Bacteria in Petridishes.

The conditions that determine whether or not a microbe can bring about infection are many. First is age. Experiments have taught us that while the adults of certain animals are very resistant to some germs, the young in some species succumb to the infection. Pigeons kept on a diet and without water just before or immediately after infection with anthrax germs rapidly take the disease and die, while in normal circumstances and conditions they are highly resistant to the disease. Other animals lose their resistance in the same way. Exposure to extreme cold or heat lowers the resistance, as is proved by the prevalence of pneumonia during the coldest part of the year when man is exposed to the changes in the weather.

An unsuitable diet, as the substitution of bread and milk for meat, does not supply the wants of certain cells or organs of the body, and hence they begin to degenerate and make it possible for microbes to attack the cells.

Bacteria also have a peculiar selection for certain organs or secretions, and these cells or secretions are modified by conditions before mentioned. These bacteria, if present, make their selection in the tissues most suitable for their growth. Diphtheria selects the tonsils, typhoid fever the gland of the intestine and pneumonia the lungs.

The power the body has of voiding off disease, of neutralizing toxins, or disintegrating bacteria is manufactured or produced in the cells and then given to the blood to a certain extent. It is learned that when antitoxin is injected into the blood it does not remain there very long. It has been discovered also that when toxins are mixed with blood only a part is neutralized, yet when the same amount is mixed with tissue cells it is all neutralized. There is something there that stimulates the cells to give up or produce more of this antitoxin or neutralizing material at times. They can be stimulated by injecting very small amounts of bacterial toxins and gradually increased, until large amounts of the toxins can be injected without effect. There are also different kinds of anti-toxins produced by the cells; for diphtheria anti-toxin does not protect the body from smallpox, nor typhoid fever vaccine protect against pneumonia. The cells manufacture a new anti-toxin for each disease.,

ACQUIRED AND INHERITED DISEASE

When speaking of the origin of disease as a rule it is said to be either inherited or acquired.

When inherited the nucleus of the disease or original cause of the disease must be started in embryonic life. This nucleus must be transferred to the embryo by the parents.

At the present day the trend of opinion is that the weakened tendency to the disease is transmitted from parent to offspring, and, if an infectious disease, the infection takes place after birth. For example, enlarged tonsils may be found generation after generation in children, and enlarged tonsils are usually diseased or may easily become diseased.

In fowls, disease germs are more apt to be transferred from the hen to the chick than is the case with mammals or the human race. When the ovule leaves its follicle there are still several layers of material to be placed about it before it is expelled. This tract, through which the egg passes and is built up, opens directly into the cloaca. This latter harbors a great many bacteria and these are capable of getting back into the oviduct just as well as the spermatozoon. These germs may be enveloped in the egg before it is laid. They may then gain entrance to the little chick at the time when the yolk passes into the chick's body and before the chick leaves the shell. That bacteria are in an egg at the time of laying has been proven by the fact that when a fertile egg begins to develop and blood vessels form, and then the embryo dies from change of temperature or unfavorable conditions, the nucleus of decay begins with the embryo and then the whole contents of the egg. It takes bacteria to cause decay or formation of gas in the egg.

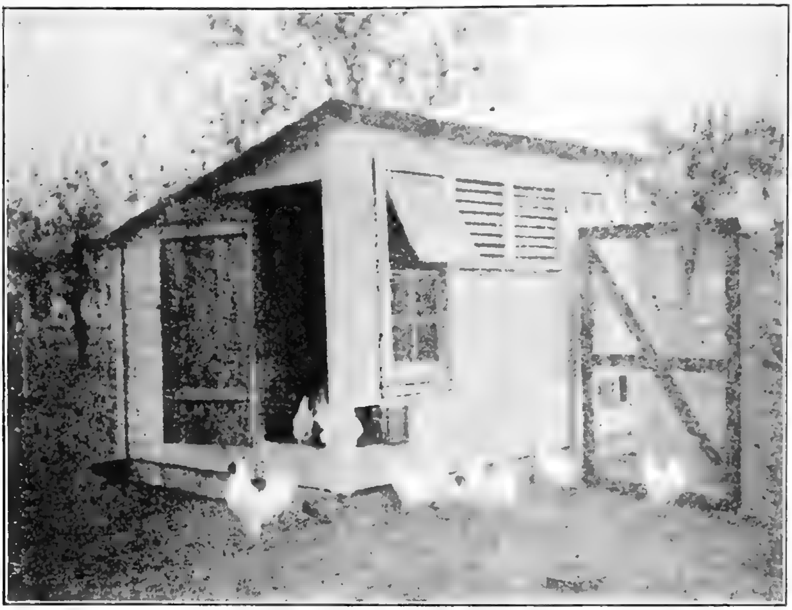

Fig. 10.

Two flocks of ten hens each roosted in this house. Both drank from same pan and ate from the same hopper. One pen contracted disease and died. The other flock remained in good health.

Another fact is brought out in the infertile egg. It seems that egg material alone is not good food or proper food for bacteria. Infertile eggs may be placed in an incubator for some time, then left in a warm room for months and not decay. The fluid part of the egg, or water, evaporates and leaves a dry mass in the shell.

Acquired diseases are those contracted after birth or in the chick after it leaves the shell. They are due to external as well as internal causes. A bruise, a cold, or over-feeding and feeding highly concentrated foods may be the starting point of acquired disease. Since poultry diseases are being studied more carefully, acquired diseases in poultry are found to be due to contagious and infectious organisms.

An infectious disease is one where the germs are carried by infected substances, as drinking water, food, pus or handling diseased animals or insects.

Contagious diseases are those where the germs are carried by the air and inhaled through the air passages.

NATURAL IMMUNITY

There is no subject connected with the poultry industry which should receive more attention than the subject of natural immunity, or the power a bird possesses to throw off or resist disease germs. This power may properly be termed constitutional vigor or vitality.

For example, two birds look alike and seemingly are alike in size, shape, health, etc., and both have the same opportunity to contract a disease. One will throw off the disease and never show any symptoms of being affected, while the other may contract it.

Very few diseases are transmitted from parent to offspring, but the weakened tendency is frequently transmitted. A hen which has contracted a disease may not transmit the disease to the chick, but since the hen is not naturally strong in combating that one disease the chick is almost sure to be weak in the same way.

We had a colony house where two pens of birds were kept, roosting in the same house, with only a wire partition, drinking from the same pan, running in yards alike, and fed the same kind of food. One pen contracted roup and six out of ten birds died in spite of all that could be done. The other pen never had a sick bird, and won prizes in an egg-laying contest. The difference was that one pen was strong in natural immunity, while the other was weak.

HOW TO MAKE A POST-MORTEM EXAMINATION

We advise all who write to agricultural colleges and experiment stations for advice about diseases with which fowls are affected to give all symptoms in detail. You should also tell how you are housing and feeding if you expect an intelligent answer. In order to give all information, it is sometimes necessary for you to make a post-mortem examination and note the condition of the internal organs. It is well to familiarize yourself with the organs of a fowl in a healthy state so you can readily note the difference.

We give here an illustration showing how to proceed. It is vitally important that our students know how to make this examination and know how to recognize disease when they see it. For that reason we look with favor upon the suggestion of Dr. F. C. Harrison, a most competent bacteriologist:

Many poultrymen have considerable difficulty in diagnosing the trouble when there is an outbreak of a disease in their flocks, and practically everyone who keeps fowls has occasionally found a dead bird, and wondered at the cause of its death. At times some fanciers have experienced some considerable loss from infectious diseases, owing to negligence in not making a proper examination of the earliest cases. In many instances a prompt recognition of the disease would have saved the poultryman from much loss and inconvenience.

Poultrymen should understand some of the more elementary facts in connection with the source, progress, changes and terminations of disease, for a knowledge of the diseased or abnormal conditions as revealed by the appearance of the organs, etc., immediately after death from the only rational foundation upon which the art of treatment can rest. According to their lesions, diseases are described as organic when characterized by definite lesions or alterations of the organs and tissues, and functional when there are no discoverable lesions, and the disease manifests itself by disturbed physiological or functional action.

Most of the diseases of poultry are acquired; that is, due to certain external agencies, such as cold, mechanical injuries, poisons, infective agents and alterations in the food.

Congenital disease, as for example malformations of the egg, and inherited disease are not of frequent occurrence among poultry.

In studying the processes of disease, defects in one organ affect the body generally, but special conditions arise in which the disease becomes localized, or confined to one organ, or it may become generalized, involving several organs or the whole body.

These facts should be remembered when making an examination of a bird, for a correct interpretation of a diseased condition is essential.

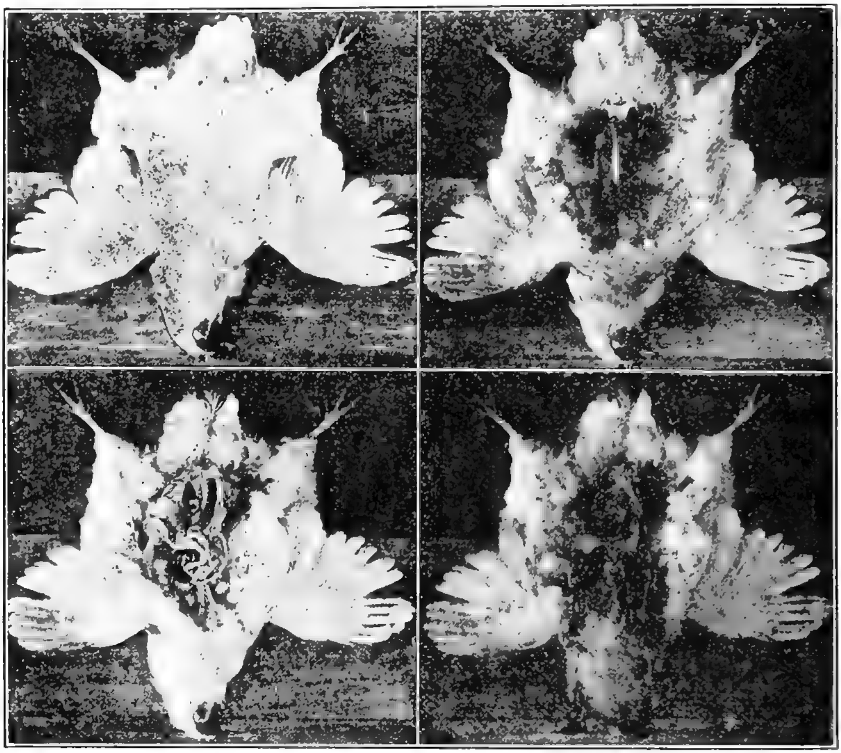

Fig. 11.

The two top pictures show how a hen should be tacked on a board for a post-mortem examination. Drive a small nail through each foot and one through the joint of each wing so the bird will be securely held to the board. The skin and feathers have been removed from the bird on the right so the breast is exposed. The two lower pictures show the breast entirely removed, and this simply leaves the intestines and all internal organs exposed, so that you can make a thorough examination. Examine healthy birds as well as diseased ones, that you may really know when any organ does not appear to be normal. Always make an examination of this kind before writing any authority for information about diseased birds. Give the facts as you see them.

HOW TO MAKE AN AUTOPSY

The following procedure is recommended for those who desire to make an autopsy or post-mortem examination:

Place the bird on a board and carefully and critically examine its outward appearance. Is the weight normal? Examine the breast muscles; if they are shrunken so that the breast bone is readily felt, it indicates poor condition and often the presence of a chronic disease.

The normal appearance of the comb, wattles and eyes varies with the breed. If they are normal, they should be only slightly lighter in color than during life. If small, light-yellow, raised spots (circular or irregular in outline, and covered with a thick, gray-yellow crust) are present on the comb, wattles and one side of the head, the disease is likely to be "Favus" or white comb, due to the presence of a parasitic fungus. The most common disease with lesions on the wattles, around beak, on the eyelids, and eye, is that known popularly as roup, canker, or sore head, terms which undoubtedly describe progressive changes of the same disease. The disease is characterized by, first, mucous discharges accompanied by inflammation and later by the presence of cheesy-like masses and wart-like tumors. Discoloration of the head in turkeys is an indication of the disease known as "blackhead," but confirmation of such an opinion is necessary by an examination of the liver of the suspected bird.

Examine the nostrils, mouth, tongue and pharynx of the bird; these organs should be free from yellowish patches or wart-like growths. If these are present the disease is in all probability roup.

Push aside the feathers at various parts of the body, and examine for parasites which live upon the external surface of the body. There are thirty or forty species of these affecting various birds, and while they may occasionally cause death, their presence is an indication of unsanitary conditions. They interfere with the vitality of the bird by sucking the blood, gnawing the skin, and interfering with sleep, and thus favoring the attack of an infective agent.

Examine the feathers around the cloaca. If they are soiled, and glued together it is an indication of an intestinal disorder. This condition is the most noticeable external sign of white diarrhea of incubator chicks, and the various forms of fowl cholera in adult birds.

Examine the legs; they should be smooth, the scales well defined and as a rule lustrous. Thickening of the skin on the under surface of the feet is often seen, and is the result of irritation, often caused by too narrow perches which compel the bird to grasp too tightly in order to maintain its position. Such a condition is equivalent to corns in man. The affection known as "bumble foot" is an aggravation of the above described condition, and is often accompanied by abscesses.

Tuberculosis and several other diseases are often accompanied by skin lesions, but the most characteristic appearances are found in the internal organs, and will be subsequently described.

This completes the exterior examination of the bird—and the next step is to open it, so as to reveal the organs in their natural positions.

THE INTERNAL ORGANS

Pluck the feathers from the front part of the breast to the junction of the neck with the body, and with a sharp knife cut through the skin and muscles to the bone, in the manner indicated in Fig. 1 (on page 14), being careful to avoid cutting the crop. Then cut through or break the bone arch (the coracoid), situated immediately in front of the breast bone; for this purpose a pair of bone cutting forceps are most convenient, but in the absence of these the bones may be cut through with a knife or strong pair of scissors. The point of the breast is now free. Then insert two fingers of the left hand beneath the breast bone, grasp the neck of the bird with the right hand and, with a strong and firm pull, draw the left hand back and the breast is torn completely away, exposing the interior of the bird, without displacing the relative position of the organs.

Without moving any parts, note the appearance and size of the various organs exposed to view. The liver, because of the color and size, will be the most conspicuous organ first seen, and we shall begin by examining it. The liver of the fowl is large, of firm consistency, and is divided into two lobes; the left lobe covers a part of the first loop of the intestine and pancreas and part of the small intestine, and the right lobe covers the true stomach (proventriculus) and part of the gizzard or muscle stomach, and the apex of the heart is between the upper end of these two lobes. It will be seen that the liver is molded as it were on these parts and presents corresponding depressions where it comes in contact with them.

The liver probably is the organ in which we find most disease and it should be carefully examined. If the liver is soft, so that the substance of it breaks down easily under slight pressure, and if this condition is accompanied by a mottled grayish appearance, the bird has fatty degeneration, a condition brought about by over-feeding and lack of exercise. This trouble is quite frequent in show birds and manifests itself shortly after they are taken off the bench, when the fancier wishes to bring them back to ordinary condition. Fatty congestion is often accompanied by the rupture of a blood vessel and sudden death.

The famous pate'-de-foie-gras is made from the livers of geese which have been over-fed and under-exercised until their livers undergo this fatty change. They are then killed and the paste or pate is made from the diseased liver.

A liver affected with tuberculosis is usually much enlarged, the increase of size depending on the amount of disease present. Accompanying the enlargement are numerous white to yellow nodules, varying in size from that of a pin's head to an inch or more in diameter. If any of these nodules are opened the contents will be found of a cheesy consistency. Poultrymen often refer to this disease as "spotted liver" or "liver complaint."

The liver of turkeys affected with "blackhead" is enlarged and darkened, and scattered over the surface are round spots, sometimes white and sometimes yellow. They are often depressed or sunken in the middle, the outside ring dark and the inner portion white in color.

Wasting of the liver is sometimes seen. In this case the organ is small and shrunken, often yellowish in color. This disease is due to improper feeding.

If we lift up the right lobe of the liver we shall note in a shallow depression the gall bladder. This is green in color and contains the bile, and is sometimes the seat of disease. The bile should be fluid. Too large a secretion of bile often distends the bladder and colors the surrounding organs green. Should the duct which connects the bladder and intestines become inflamed or plugged up, the bile is absorbed by the blood vessels and causes a yellowing of the tissues and flesh. This condition is known as jaundice. A small oval dark-red body situated just beneath the liver is the spleen. In birds suffering with tuberculosis it presents somewhat the same features as are described under tubercular liver.

The heart is not often diseased; occasionally we find it ruptured and the body cavity filled with clotted blood.

Attention should be next directed to the lungs. These are situated just above the heart and are easily recognized by their bright red color and spongy consistency. The lungs in birds are attached to the inner side of the walls of the chest.

The most common infection of the lungs is congestion or inflammation. This is easily recognized by parts of the lungs being dark in color and solidified. If such pieces are cut out and thrown into a glass of water they will sink. Healthy lung tissue always floats.

The digestive organs next claim our notice. It is better to examine these throughout their entire length. Begin with the gullet and follow it to the crop, in which the food is softened. The walls of the crop are thin and muscular. The two most common manifestations of disease are (a) inflammation:—In this condition the crop is much distended and the contents very liquid and gassy and of an offensive odor; (b) paralysis:—In this state the muscular walls are so stretched that their use is lost or paralyzed, and in consequence the food cannot be emptied. The crop in this disease is usually very large and packed solid with food.

Leaving the crop, follow the tube in the direction of the gizzard; just before this organ there is a wider portion known as the true stomach or proventriculus. The food from the crop passes into this in small quantities and becomes mixed with the gastric juice secreted by glands in the walls of the true stomach. This juice aids in the digestion for the albuminoids of the food, but the grinding action of the gizzard is necessary to crush and macerate the seeds which are the food of so many birds. The true stomach is often the seat of inflammation, which can be recognized by the thickening of the walls and the collection of much mucous on the inner walls.

From the proventriculus pass on and examine the gizzard. It will be necessary to cut the skin over the surface of the intestines at this stage, and the gizzard may then be pulled out and examined. The gizzard has been very properly called the "muscular stomach," and if you take a knife and cut it in two, the thick, fleshy muscular walls, of a dark red color, will be observed, and lining it the horny internal wall, of a greenish-yellow color, with numerous shallow folds. The grain and seeds are here ground up by the action of the muscles aided by the grit and gravel which is mixed with the food.

The gizzard does not often show indications of disease. Occasionally we find a pin or tack penetrating the hard interior lining into the muscular tissue, with discoloration and death of the surrounding tissue. In birds poisoned with phosphorus from eating rat poison and matches it usually shows some slight inflammation. If the contents of the gizzard are smelled, the odor of the phosphorus can be noticed.

Leaving the gizzard we follow the intestine throughout its length. The first loop of the small intestine surrounds the pancreas, a narrow elongated organ, pinkish in color, firm, and with a granulated surface; certain ducts from this gland pour the pancreatic juice which emulsifies the fat of the food, into the small intestine. The small intestines are quite long, and continue until we reach a portion where we meet with two blind ends. This point marks the beginning of the large intestine, and it ends at the orifice, called the cloaca. The two blind tubes called the caeca also open into the cloaca.

DISEASES OF THE INTESTINES ARE COMMON

The intestines vary in color and appearance throughout their length. They are pinkish white, and when carefully inspected numerous fine blood vessels will be noticed all over their exterior surface. The caeca are greenish white in color, the blind ends as a rule darker than the portion nearer the cloaca.

No portion of the bird or no organ, excepting perhaps the liver, is more prone to be affected than the intestines. All intestinal troubles, like catarrh, diarrhoea, cholera, enteritis, etc., produce more or less profound changes in the appearances of the intestinal tract, the most significant of these being the reddening of the intestine and dilation of the blood vessels.

In the disease of turkeys already mentioned (blackhead), the caeca are the principal seat of the disease, the walls become greatly thickened and the canal fills with a yellowish white mass, built up of layers of blood and cells. Sores with crusts also form on the walls.

The contents of the intestines should be examined for the presence of worms, as both wire worms and tape worms attack poultry.

We have now lifted out of the body cavity the bulk of its contents; there remains, however, at the very bottom the kidneys. These may be recognized as flattened, elongated bodies, fitting closely into the hollows of the pelvis. They commence immediately below the lungs, and extend along the sides of the spine as far as the rectum. Their texture is rather frail, rapidly yielding under the pressure of the finger, to which they give a granular sensation. The secretion from the kidneys is not fluid as in mammals, but is a white semi-fluid mass which soon hardens, sometimes causing obstruction of the cloaca. This is noticeable in the white diarrhoea disease of chicks. Too much animal food may produce the same trouble in pullets.

In male birds the tests are two in number, oval in shape and whitish in color. They are situated near the upper extremities of the kidneys. They vary in size with the season of the year, becoming large during the breeding season. They connect by two tubes, which lie close to the ureters, with a small opening on the projection on the wall of the cloaca.

In the female, the ovary and oviduct on the right side are entirely lacking, or are so reduced as to be hardly noticeable, but the organs on the left side are very large and well developed, especially during the breeding season. The ovary is situated in the abdominal cavity near the lumbar vertebrae. It consists of a grape-like mass or cluster, composed of a large number of ovules in various stages of development, some very young, small and white, others older, of considerable size and yellow in color. From the ovary a long tube conducts the egg to a small but dilatable opening in the cloaca. This tube called the oviduct, is rather long, of wide diameter, dilatable and flexuous, and only exists in the state here described during the breeding season; at other times it is much smaller and shrunken. The oviduct has three well marked regions.

(1) The wide open mouth at the top near the ovary.

(2) The twisted or coiled glandular part, which secretes from the glands its folded mucous membrane the albumen or white of the egg, which is added in layers on the yolk.

(3) A short wide portion which produces the egg shell and which opens into the cloaca.

The most common disease of the ovary is gangrene, easily recognized by the brown or discolored ova, accompanied by putrefaction. Tumors are often found and look like the yolk of a hard boiled egg.

The oviduct may also become gangreneous and the tissue decompose and putrefy, and the eggs escape into the abdominal cavity.

PRECAUTION

In no circumstances should you doctor a sick fowl or make an examination of one, then feed and water your poultry, without first taking every precaution to cleanse your hands. You may spread disease in this way, and can also carry it on your shoes, or on your clothing. Do not use the same feed bucket for both sick and healthy birds. You cannot be too careful in preventing the disease. Buckets and vessels used for diseased birds should be painted red, which signifies "DANGER."

ISOLATION OF THE SICK AND DISPOSAL OF DEAD BIRDS

There is no practice so detrimental to the health of a flock as that of allowing sick birds to remain in the flock until they die. Every one should have a place for keeping sick birds away from the flock; a coop in the garden where other chickens are not permitted to go is usually one of the best places.

It is a good plan to bury, or a better plan to burn, all diseased birds as soon as they die or as soon as they are killed. All birds which contract any serious disease should be killed. If they cannot be burned, the next best method is to bury them deep in some out-of-the-way place where the flock does not range. Covering with lime, then with earth, is an excellent idea. Never permit any dead birds or other animals to be around the premises.

FOOD AND QUARTERS FOR SICK BIRDS

When fowls become sick with any disease, it is best to remove them to a coop or a house, where the birds can rest in comfort, and be separated from the general flock and not be disturbed. The coop should be on a high spot of ground and dry. It should not be artificially heated, but provided with ventilation day and night. Put up a perch, have clean litter and a clean drinking pan. The quarters for sick birds should be clean, dry and comfortable.

Many poultrymen make the mistake of feeding whole grain to their sick birds. We prefer a ground grain mash mixture composed of equal parts cornmeal, wheat bran, middlings and ground oats. Slightly moisten this with sweet or sour milk. Feed sparingly until the birds begin to regain their health. Epsom salts can be fed in this mash. We recommend formula No. A1, as mentioned under treatment for roup. Table scraps are very good for sick chickens. Whatever is fed, we think best to feed sparingly. Give the food on a clean board, trough or pan provided for that purpose. Remove the feeding vessel after each meal and never leave feed for the sick birds to walk over.

CARELESSNESS

Carelessness and neglect often cause trouble. The above cut shows a healthy chick kept in a brooder in which the droppings have not been cleaned out as they should have been. This caused balls to accumulate on its toes till it could not walk. If not attended to, such chicks will grow weak, contract disease and die.

MOULTING

The moulting time is a very important season in the year's work of the hen, as her success during the winter depends greatly upon the coat she wears.

The better condition in which a hen goes through the moult the sooner she will begin laying and the more eggs she will lay during the winter. Moulting is not considered a disease, but the birds should receive the best of care when in this condition. There are said to be about 8,000 feathers on a hen, and you can see that the manufacture or growth of this large number of feathers would be a great drain upon the hen's system and very telling upon her vitality in many cases.

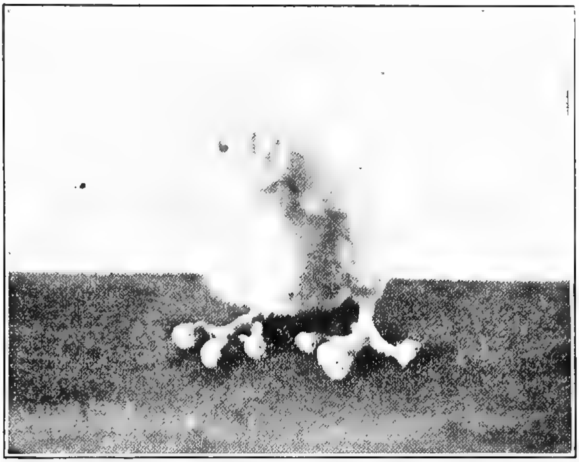

Fig. 12.
Filthy brooder floors have caused balls to accumulate on the toes of the chick until it can scarcely walk.

HOW TO CLEAN AND DISINFECT A POULTRY HOUSE

The following excellent advice is given by Dr. Raymond Pearl of the University of Maine:

"Not every poultryman of experience really knows how to clean a poultry house. The first thing to do is to remove all the litter and loose dirt which can be shoveled out. Give the house—floor, walls and ceiling—a thorough sweeping and shovel out the accumulated debris. Then play a garden hose, with the maximum water pressure which can be obtained, on the floor, roosting boards, walls and ceiling, until all the dirt which can be washed down easily is disposed of. Then take a heavy hoe or roost board scraper and proceed to scrape the floor and roosting boards clean of the trampled and caked dressing and dirt. Shovel out what has been accumulated and get the hose into action once more and wash the whole place down again and follow this with another scraping.

"Next, with a stiff-bristle broom, thoroughly scrub walls, floors, nest, boxes, roost boards, etc. After another rinsing down and cleaning out of accumulated dirt, let the house dry out for a day or two. After this process make a searching inspection to see if any dirt can be discovered. If so, apply the appropriate treatment as outlined above. If, however, everything appears to be clean, the time has come to make it really and truly clean by disinfecting. To do this it is necessary to spray or thoroughly wash with a scrub brush, wet in the solution used for all parts of the house, with a good disinfectant at least twice, allowing time between for it to dry."

Any of the good disinfectants can be used, such as creolin, zenoleum and others.

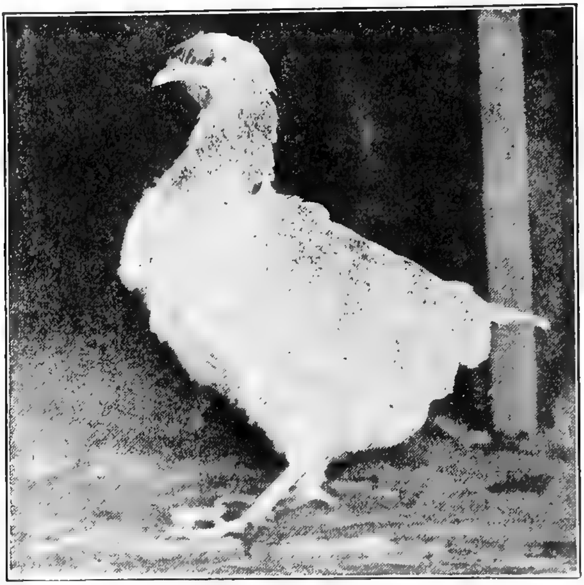

Fig. 13.

MOLTING.—There are about 8,000 feathers on a hen and each has to manufacture her own winter coat. This is quite a strain on the hen and is a dangerous time in her life. For that reason she should be protected from storms at this period. It requires about three months to molt and to recover from it, so don't expect many eggs from your hens during this time. The hens must have a rest.

To make a complete job, follow the foregoing treatment with a whitewash brush, and your house will be clean and healthful as hands can make it. The whitewashing will depend upon the time of year and the accommodations for the fowls, but if possible have it done before they are again allowed to enter the house. A good whitewash, one that will stick and not rub off, is made as follows, in these proportions:

UNITED STATES GOVERNMENT WHITEWASH

Unslaked lime	two pecks
Common salt	one peck
Rice flour	three pounds
Spanish whiting	one-half pound
Glue	one pound
Water	sufficient quantity

The quantities given are sufficient to make nine or ten gallons of whitewash. If only part of the whitewash is needed, the remainder can be kept for future use. Should a smaller quantity be desired, the proportions can be cut down to suit.

DIRECTIONS—To properly make the amount of whitewash above mentioned, two vessels are needed, one holding at least ten gallons and the other holding half as much. A small barrel and a tub or any water-tight vessel will answer very well.

1. Slake the lime in the barrel, using two or three gallons of water for two pecks of lime. 2. Cover the barrel. 3. Dissolve the salt in water, strain the brine and add it to the slaked lime in the barrel. 4. Boil the rice flour for ten minutes in a small quantity of water. 5. Dissolve the glue in a double cooker or water bath and avoid scorching 6. In the tub mix the whiting with about five gallons of hot water. 7. Add to the whiting mixture in the tub the boiled rice and the dissolved glue. Mix thoroughly. 8. Pour the mixture in the tub into the barrel containing slaked lime and stir well until thoroughly mixed. 9. Cover barrel to protect from dirt and let whitewash stand for a few days, when it will be ready for use. This whitewash should be applied hot if best results are to be obtained. 10. Heat it in any kettle or other vessel on a stove or suspended over a fire.

Before allowing the fowls to return to the clean house they themselves should be made clean by a thorough treatment for lice.

TREATMENT OF THE YARDS

The poultry yard is as often a source of infection as the poultry house. Poultry that is allowed to run on one piece of ground year after year, the yard not cultivated, the soil not stirred and no green food grown on it, is certain to become contaminated by various germs, sooner or later. Many failures can be traced directly to soil contamination. This is a very important thing and never should be neglected. If the yards are not large enough to be plowed, then have them spaded and seeded. We prefer free range, and if it is necessary to yard and confine the birds, we like the double yard system. Thus we can grow some food in one yard and cultivate it while the fowls use the other.

Fig. 14.
Spade or cultivate yards. Keep the soil pure and sweet. Sour, filthy soil breeds disease.

We find many farmers and some poultrymen who, in spite of the fact that they have an abundance of land which is available, and might be used, will exercise the short-sighted policy of having small yards and will keep the coops, houses and poultry on the same ground year after year and never cultivate or try to sweeten and purify the soil.

Put lime on the land if it is badly contaminated. Plow this into the soil. Cultivate the ground, and expose the soil to the action of the sun, air and rain. Grow some crops or green food for the poultry at the same time. It will pay to heed this advice.

FAKE REMEDY COMPANIES

A lot of money is being made by certain fake remedy or poultry supply companies. They are advertising and selling large quantities of remedies, so-called egg producers, etc., in which there is not a nickel's worth of virtue. If you wish to buy something already prepared for the treatment of various diseases, we would advise you to use remedies from dependable firms. All reliable firms have experts employed who are trying to perfect remedies and various methods of treatment, and they give you your money's worth.

REMEDIES WHICH WE RECOMMEND

As a treatment for practically every disease, we have recommended more than one method. We do that, not to confuse you, but for the reason that some things can be secured from certain local druggists, and other things which we recommend are not procurable from these druggists. Therefore, it is necessary to give more than one treatment in most cases. But those which we do give have proven to be the very best and no serious mistakes will be made in using any of them. You will find that a certain bird will respond to one treatment and the same bird will often not respond to a different treatment. So if you are not successful in the use of one remedy, try another. Remember that a few days must be allowed for any remedy to have time to become effective and show results.

AN INTESTINAL ANTISEPTIC

A good intestinal antiseptic can be made by using one 7.3 grain tablet of bichloride of mercury to each gallon of drinking water. Use cement, earthen or wooden vessels as bichloride of mercury is affected by metal. This antiseptic is a good thing to use in cases of diarrhea.

WHY A FOWL BREATHES

The body of a fowl is like a furnace in that it takes fuel and burns it, forming heat and energy. Its food, like the fuel of a furnace, consists principally of carbon and whenever carbon burns heat is formed and carbon dioxide is created. The oxygen in the air which they breathe combines with the carbon in their bodies to keep them warm and give them strength to move about and lay eggs. The carbon dioxide so formed is breathed out through the lungs.

A pound of carbon burning in a bird's body forms the same amount of heat or energy as it does when it burns in a furnace, but the combustion is much slower and is taking place all of the time. The original source of all their food is from plants which also breathe, only the process is reversed in their case. Plants breathe in carbon dioxide from the air and separate the carbon from the oxygen. The oxygen is returned to the air and the carbon is used to build up the tissues of the plant. Thus we see a continuous cycle; a bird eats the plants as food and returns the material to them through the air. The supply of oxygen and carbon dioxide in the air is kept in about the same proportion although it may vary somewhat in different localities and under different conditions.

The source of all heat and energy is the sun. Plants use this energy, which comes to them in the form of sunlight, to manufacture carbon from the carbon dioxide of the air, and they store up this carbon in their tissues for man and fowl to utilize as food and fuel. Our breathing then has the same relation to our bodies that the drafts have to the furnace; it furnishes oxygen to the carbon of our food so that it will again form into carbon dioxide and liberate the heat and energy which the plants stored up from the sun.

FROZEN COMBS AND WATTLES

Frostbitten combs should be thawed out slowly. Put the bird into a room that will warm up gradually, for the circulation should not be allowed to begin suddenly. Snow held against the frozen comb is often recommended. After the circulation has been restored and the comb thawed out, apply an ointment twice a day, made of two tablespoonfuls of glycerine, one tablespoonful of turpentine and six tablespoonfuls of vaseline. Camphophenique applied locally is often beneficial.

This question is often asked, "Will a frozen comb affect the future breeding qualities of a bird?" We have not found that this has any effect whatsoever on breeding stock, except during the period when a bird was suffering from a frozen comb. After the comb had entirely healed over and the frozen part had dried up and dropped off, we have never experienced any trouble along this line.

One of the best preventives and remedies that we have ever used is skunk oil. If you feel that it is going to be an extremely cold night and the temperature will go far below freezing point, if you have any choice males whose combs you are anxious to save, it is a good idea to go to the poultry house before dark and put some oil on the comb and massage it well. Do the same in the case of the wattles. Rub the skunk oil on freely and then massage it well. This has really proven to be one of the most effective preventives and remedies that we have used for frozen combs.

DUB COMBS TO PREVENT FREEZING

On some poultry farms it is the custom of the owners to dub all of the birds, both male and female. They claim that the extra feed, blood and vitality that is required in maintaining the comb is of no benefit and for that reason they dub the birds, both comb and wattles.

A bird with a frozen comb suffers intense pain, and during that period will stand around drawn up and sometimes die because of the frozen part, but after the comb is healed over they make just as good breeders as they would had their combs never been injured.

CHICKEN POX OR SORE HEAD

We have tried various methods of prevention and treatment of this disease. Usually you can recognize it by the following symptoms:

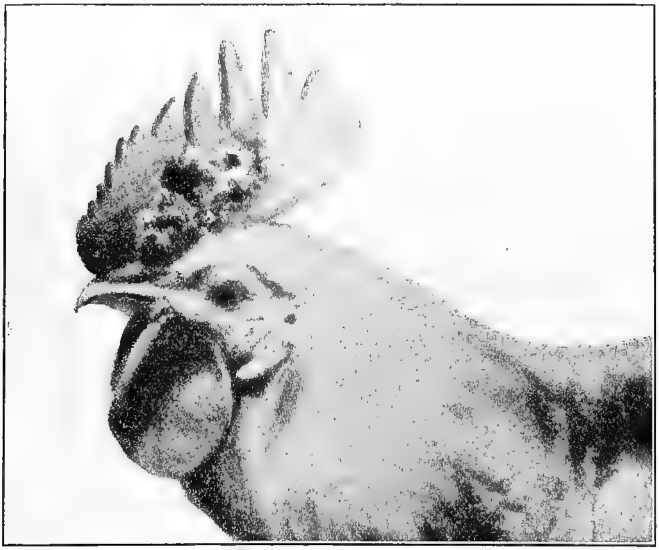

Fig. 15.
Chicken Pox or Sore Head. Treat as directed.

Little warts, nodules or scabs form on the comb, face and wattles. When one starts, several usually follow. The disease is not necessarily fatal, but gives the bird an ugly appearance, and may result in affecting the general health. The disease is contagious. It is often started by birds brought into the flock, and is especially noticeable in damp, cold weather in houses which are not kept clean and dry or properly ventilated.

TREATMENT:—The small nodules or scabs should be removed with the fingers, simply pulling the scab off. Take a camel's hair brush or a clean feather and dip it into undiluted zenoleum or creolin, or tincture of iodine and touch the sores lightly with the feather or brush. Another scab will form and in a few days drop off. Rub the face, comb and wattles with mentholatum, menthol salve or carbolated vaseline. Do not pick at these scabs continually. Once removed and treated is sufficient.

As soon as any indication of an outbreak of chicken pox is noticed, you should measure out about three-fourths of a teaspoonful of Epsom Salts to each fowl and then feed it to the entire flock. Dissolve the salts in water and moisten some ground feed with this solution. Starve the birds for one meal before feeding same. Repeat this in about three or four days. After the sores have been treated once, it is not necessary to treat a second time.

Very often cases of chicken pox can be cured by touching the scab and rubbing the zenoleum or creolin around and over the scab. If the scabs form on the eye lid, there is danger of the eye being put out. In cases of this kind it is a good idea to make a solution of two parts water and one part creolin or use undiluted zenoleum. Use two or three drops of this in the eye thus affected.

The vitality of the flock must be increased by stimulating, palatable feed, such as milk, mashes, green feed, green cut bone, and grain. A tonic of 1 part epsom salts, 1 part dry powdered sulphur to 12 parts of dry mash has given good results. Mix to a crumbly condition with milk or water and feed every other day until the condition of the flock improves. Bad cases with false membranes in the mouth should be killed and burned. All others should be isolated, when possible. These cases should receive a head bath in 1 to 1,000 solution of bichloride of mercury, made by placing a 7.3 grain tablet in a pint of water.

PREVENTIVE FOR CHICKEN POX

In some of the Southern States where chicken pox or sore head is so prevalent, they have a treatment which seems to prevent this disease to a great degree. About the first of July they dissolve a teaspoonful of epsom salts in warm water, and this solution is used to moisten enough mash for a dozen chickens. Every third or fourth day they add the same amount of sulphur to the mash instead of the salts. They keep up this alternate treatment until fall. The result is their flocks seem to be immune to this and other diseases. Our opinion is that the systems of the fowls are in such good condition that they throw off the germs. Formula No. A1 as recommended for roup is one of the best things that can be fed to prevent this disease.

If the crusts or nodules are removed, the head washed in a solution of water and some good disinfectant, and then the sore dusted with iodoform, it will often effect a cure.

FLOCK TREATMENT FOR CHICKEN POX

As a flock treatment for chicken pox, we use three (3) ounces of sulphuric acid and three (3) ounces of oil sassafras mixed with one-half gallon of water in an earthen vessel. Supply this to the flock by placing two tablespoonfuls of the above mixture in each gallon of drinking water. Use no other water for a week or two. After desirable results begin to be noticeable, reduce to one tablespoon of above mixture to each gallon of drinking water until the flock is entirely free from the disease. In mixing the above it is well to do so out-of-doors, as occasionally we have had an explosion when the acid and sassafras are mixed together in a close, warm room. You will experience no difficulty, however, out-of-doors.

REMOVE SCABS ONLY FOR FIRST TREATMENT

Individual birds, badly infected, should be removed from the flock and placed in coops in dry, comfortable quarters. Remove the scabs from about their face, comb, wattles or ear-lobes and paint the raw spots with full strength of tincture of iodine. Repaint the spots once each day until they are finally dried and crumble off. Do not remove the scabs except the first time.

TREATMENT—TINCTURE OF IODINE

Of the various kinds of disinfectants recommended for the treatment of this disease, tincture of iodine has been found to be the most satisfactory. The scabs which form on the tumors of the comb, wattles or skin should be removed with a dull knife or a pair of forceps and tincture of iodine applied to the exposed surface.

Collections of exudate on the mucous membrane of the mouth should be removed with forceps or a curette and the exposed membrane treated with tincture of iodine. All collections of exudate on the eyelids can usually be removed by pressing with the thumb and finger tips around the eye. If any of the exudate should adhere to the cornea it should be removed with forceps and it may sometimes be necessary to use forceps also in removing the exudate from beneath the third eyelid at the inner corner of the eye. Afterwards drop one drop of tincture of iodine into the diseased portion of the eye lid. Try not to touch the eye ball.

The tincture of iodine can be applied most conveniently in all cases with a feather or camel's hair brush. Treatment should be repeated as often as the scabs or exudate reform. Any fowl that does not show a marked improvement in condition after three or four treatments will usually recover very slowly. In such cases, unless the fowl be very valuable for show, breeding or other purposes, it is more economical to destroy it than to give further treatment. Never remove the scabs except for the first treatment. After that paint and treat right over the scab.

Collections of exudate within the nasal sinews always produce marked swellings of the face. This condition is relieved by making an incision through the skin over the swelling, removing all the exudate with a pair of forceps or curette, and then packing the cavity with absorbent cotton saturated with tincture of iodine. The cotton pack is necessary to keep the incision through the skin from healing too rapidly. If not packed, the wound will quickly heal, the exudate reform and no benefit be derived from the operation. The pack also assists in controlling the hemorrhage which is always severe. When the hemorrhage is unusually severe, it should be checked by the application of a strong caustic, such as silver nitrate. The cotton pack should be removed, the wound cleansed and a new pack put in every two or three days as long as the exudate continues to form. When, upon the removal of the pack, it is found that no exudate has formed, the pack may be left out and the wound allowed to heal.

THE TREATMENT AND PREVENTION OF CHICKEN POX

There is perhaps no authority in this or any other country who has done as much along experimental lines, treatment and prevention of chicken pox of fowls, as has Dr. J. R. Beach of the Division of Veterinary Science of the University of California. We therefore want you to get his viewpoint.

Chicken pox is a disease that has been very prevalent among fowls in the state of California. While Mr. Quisenberry was in charge of the Poultry Department at the World's Fair at San Francisco and had charge of the International Egg Laying Contest which was held in connection with same, Dr. Beach was in charge of the disease work in connection with the same fowls and was experimenting on cases of chicken pox on these same birds. He was developing a vaccine for the treatment and also for the prevention of the disease and was meeting with wonderful success at that time and has perfected same since that date. He has treated thousands of fowls in that state with good results since that time. I do not believe anyone has perfected vaccine to such a point as he has for this particular disease.

Mr. Quisenberry was so impressed with the work that he had Dr. Beach deliver an address before the American Poultry Association on this subject during the Exposition at San Francisco. One of the most recent discussions of the subject by Dr. Beach was his address before the American Association of Instructors and Investigators, which was recently published in their journal. Dr. Beach says:

"The relationship between the various pathological conditions of the head of domesticated fowls has been the subject of much controversy. These conditions are variously designated as chicken pox, contagious epi thelioma, avian diphtheria, canker, colds, contagious catarrh, swelled-head, roup, etc. Ward and Gallagheri in their recently published work, "Diseases of Domesticated Birds," express the opinion that all of these conditions are due to the same etiological factor, namely, "the filterable virus of chicken pox or contagious epithelioma." The results of extensive study of these diseases at the California Agricultural Experiment Station, however, have led us to the conclusion that, as they occur in California, there is a distinct difference between some of them.

"*Classification of Diseases Involving the Skin or Mucous Membrane of the Head:* In order that there may be no misunderstanding of the nomenclature of lesions or diseases used in this discussion, I will give briefly our conception of them. *Chicken pox or contagious epithelioma* is a readily transmissible disease manifested by the formation of small, wart-like epithelial tumors on the comb, wattles, or skin of the head. The sole causative factor of this disease is accepted to be the filterable virus of contagious epithelioma. *Canker or avian diphtheria* is manifested by formation of masses of adherent, cheesy exudate on the mucous membrane of the mouth or eyes. These diphtheritic lesions should not be regarded as evidence of a specific infectious disease, since factor other than the filterable virus of contagious epithelioma are known to sometimes produce them. *Colds, catarrh and roup* are manifested by a viscid discharge from one or both nostrils, which has a tendency to collect in the nasal sinuses where it undergoes rapid transformation into a cheesy mass causing marked swelling of the face beneath the eyes. Such lesions, as in the case of canker, are believed to be due to a variety of causes.

"There is abundant evidence, both clinical and experimental, to indicate that chicken pox and the most common form of canker are due to the same causative factor. Diphtheritic lesions or canker in the mouth or eyes can be produced by intravenous or subcutaneous inoculation with a suspension of finely ground chicken pox virus derived from scabs removed from the tumors on the skin of diseased birds, or by applying the virus to a scratched surface on the comb. In like manner, typical chicken pox lesions may be produced by inoculation of the comb with material from mucous membrane lesions. A vaccine prepared from dessicated chicken pox scabs affords protection against canker as well as chicken pox. In outbreaks of chicken pox, the number of affected fowls with canker of the mouth or eyes only may be as high as sixty per cent.

"However, as above stated not all cases of canker can be regarded as due to chicken pox virus. We recognize three distinct forms which for convenience we classify as *chicken pox canker, mechanical canker and malignant canker.* Mechanical canker is produced by injury to the mucous membrane. It commonly occurs in the cleft in the hard palate and inner corner of the eye as a result of a particle of litter or kernel of grain becoming lodged there. Removal of the cause results in prompt recovery. *Malignant canker* is so classified on account of its nature. It commonly occurs on the base of the tongue or the side of the larynx, penetrates deeply into the tissue, does not respond to any treatment so far attempted, is accompanied by general symptoms such as depression, loss of appetite, and rapid emaciation, and practically always terminates fatally. All attempts to determine the cause have thus far been unsuccessful. However, since it is of rather rare occurrence and has shown no tendency to spread from diseased to healthy fowls in the same flock, it is not yet of much economic importance. Since chicken pox is the subject to be discussed, when the term "canker" is used hereafter in this paper it will refer only to "chicken pox canker."

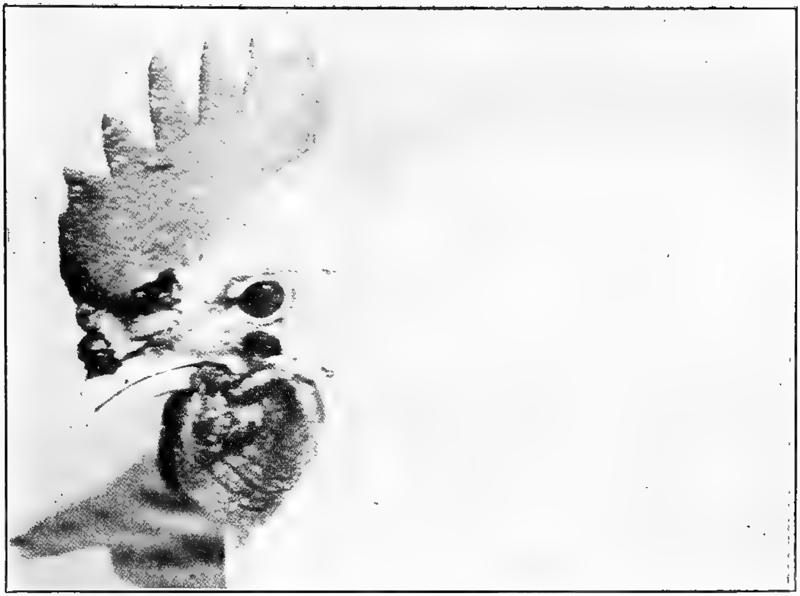

Fig. 16.
Chicken pox on cockerel—natural infection.

"We have found little to indicate that there is any relationship between chicken pox and roup, but instead, considerable evidence that they are not, as a rule, in any way related. A nasal discharge is so infrequently associated with canker, especially in the early stages, that it would seem there is little ground for considering this an indication of chicken pox or canker when it does occur. Even in very severe advanced stages of canker, the nasal passages are not necessarily involved. On the other hand, it is extremely rare to find canker of the eyes or mouth accompanying roup. Even though the sinuses may be so distended as to cause the eyes to become closed, as a rule, no cheesy material is formed in them. It is a well established fact, that birds that have recovered from chicken pox are immune to the disease. It has been frequently observed, however, that birds that have had chicken pox are not rendered immune to roup, nor that birds that have had roup are immunized against chicken pox. It is very probable that there are always a few cases of roup present in all large flocks no matter how well they may be housed and cared for, but we have yet to observe an epidemic of roup in any flock in California, that was given proper care. Chicken pox and canker are just as liable to attack a well cared for flock as one poorly cared for. Therefore, we do not consider roup to be related to chicken-pox, to be a specific infectious disease nor a menace to successful poultry raising.

"*A Malnutritional Disease Resembling Roup*:—There has occurred during the last year epidemics of a disease involving the mucous membrane of the mouth, pharynx, eyes and the nasal passages which closely simulates roup, but which has been found to be entirely distinct. In the mouth and pharynx we find pustule-like caseous patches 1 to 2 mm. in diameter. On pressure, we find that the caseous material penetrates quite deeply into the mucosa. These may be so numerous as to give the mucosa, especially of the pharynx, the appearance of being covered with caseous false membrane. These pustules are often found in the mucosa of the esophagus as far as the proventriculus. We also frequently find the cleft in the hard palate and the glottis filled with caseous exudate. In the eyes we find first a thin, viscid discharge which may glue the eyelids together, then the formation of a tightly adherent white membraneous film over the third eyelid, and finally the collection within the eyelids of a mass of white cheesy exudate. There is usually a clear, viscid discharge from one or both nostrils which later may become turbid and flocculent, and be followed by swelling of the nasal sinuses. On post-mortem examination of dead birds, we usually find the kidneys severely involved. They are usually very pale and marked with a network of very fine white lines which are urate filled tubules. We also frequently find a deposit of white material, probably urates, on the liver, heart and other organs. The results of our study of this disease have led to the belief that although it frequently affects large numbers in the same flock, it is not of an infectious nature, but rather due to some nutritional disturbance. This belief was arrived at after failure to transmit the disease from diseased to healthy birds or to find any species of bactera which appeared to be a causative factor and success in controlling and reproducing the disease by certain methods of feeding. This disease is always mistaken for roup by poultrymen, and it is very possible, that many so-called "outbreaks of roup" have in reality been this nutritional disease.

"*Treatment of Chicken Pox:*—In the treatment of chicken pox and canker, we have found that the administration of chicken pox vaccine is a valuable adjunct to other remedial measures. The scabs from the pox tumors and caseous exudate from the mouth or eyes are removed with forceps. Tincture of iodine is then applied with a medicine dropper. This treatment is repeated at two or three day intervals as long as necessary. Except in very severe cases not more than two or three treatments are necessary. In addition, two or more 1 or 2 mil doses of chicken pox vaccine at three to five day intervals are given. In experiments to determine the curative value of chicken pox vaccine, five hundred and thirty-six diseased fowls were used. They were divided into two lots of two hundred and sixty-eight each. In order that there might be a nearly equal number of fowls in each lot with lesions of the same type and degree of severity, the location and severity of the lesions were the basis upon which the selection of the birds for each lot was made. Each bird in one lot was given two 1 mil doses of vaccine in addition to local treatment of the lesions, while the birds in the other lot received local treatment of the lesions only. The percentage of mortality of fowls in the lot receiving vaccine was 19.6, and of those in the lot not vaccinated 38 9. The average number of days required for recovery of the fowls vaccinated was 10.8, of those not vacci-

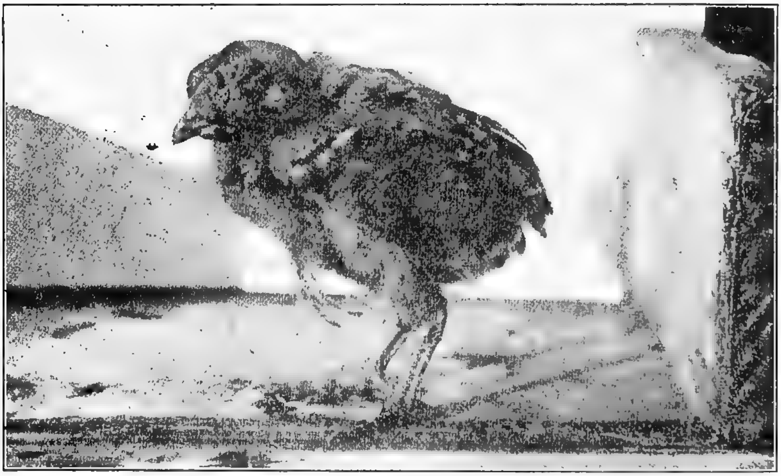

Fig. 17.
Chicken pox, baby chick—natural infection.

nated 13.7. From these results it would appear that the use of vaccine is of considerable value in the treatment of chicken pox and canker.

"*Prevention by Vaccination:*—It is for prevention rather than cure, however, that chicken pox vaccine is designed and chiefly used. The first vaccine experiments in California were made in 1914. The results obtained were so satisfactory that the vaccine was recommended for use to commercial poultrymen. It was only natural that at first many poultrymen were skeptical of the value of vaccination. Continued good results, however, soon dispelled this skepticism and at present in California the use of chicken pox vaccine by poultrymen is as general as the use of blackleg and anthrax vaccine by cattle raisers in infected districts. During the fiscal year ending June 31, 1920, the California Agricultural Experiment Station furnished vaccine for over 300,000 birds.

"*Propagation of the Virus:*—The method used in preparing vaccine is a development of that used by Manteufel in 1909 and Hadley and Beach in 1912-13. Scabs removed from chicken pox lesions are the source of virus used in preparing vaccine. The virus is propagated by inoculating the combs of healthy cockerels with a suspension, in sterile water, of dried ground scabs. Only scabs from the comb are used, any lesions developing upon the mucous membranes being discarded. The inoculation is made by moistening one side of the comb with the suspension of ground scabs then vigorously scarifying the entire surface with a large dull hypodermic needle or other instrument, and then moistening the scarified surface with the suspension of scabs. This process is repeated on the other side of the comb. Care is taken that none of the virus comes in contact with the mucous membrane of the eye. Lesions appear in five to seven days and develop sufficiently to permit the removal of scabs in two to three weeks. A second growth of scabs can be removed seven to ten days later. The percentage of mortality of the inoculated birds ranges from fifty to one hundred per cent, the greatest loss usually occurring soon after the first growth of

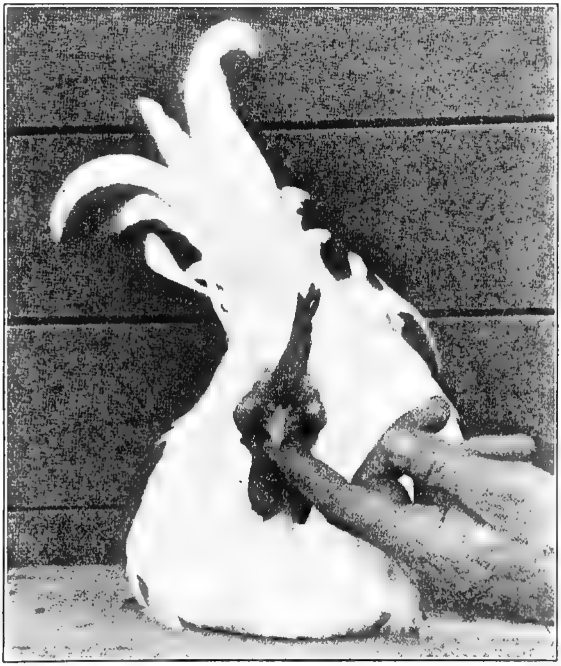

Fig. 18.

Canker-eye—from natural injection with chicken pox virus.

scabs is removed. After removal, the scabs are thoroughly dried and reduced to a fine powder by grinding in a small coffee mill, and then in a ball mill for twenty-four to forty-eight hours. This powdered virus if perfectly dry, will keep for months and may be stored in sterile bottles until needed in preparing vaccine. High potency of the virus is maintained by keeping fowls constantly inoculated and using for inoculation purposes fresh dried scabs from severe cases, and by occasionally securing new strains of virus from naturally infected birds.

"*Method of Preparing Vaccine:* One gram of the powdered dessicated virus to 100 mils of physiclogical salt solution is the proportion used in making vaccine. This proportion was adopted after making numerous trials with varying amounts of virus. Aseptic precautions are observed. The virus is first weighed out and placed in a sterile mortar with a sufficient amount of sterile salt solution to make a paste, and ground for at least five minutes or until the mixture acquires a smooth cream-like consistency. Four or five mils of sterile salt solution to each gram of virus is required for this purpose. To this mixture is then added sufficient sterile salt solution to bring the volume up to 80 mils. It is then poured into a sterile flask or bottle, placed in a water bath and heated at a constant temperature of 55 degrees C for an hour. It is then filtered through sterile cheese cloth into a sterile flask or bottle and to it is added 20 mils of sterile salt solution containing 1 per cent of tricresol which mixture is poured through the filter so as to wash out as much of the pulverized material as possible. After cooling in running water or ice water until the temperature is below

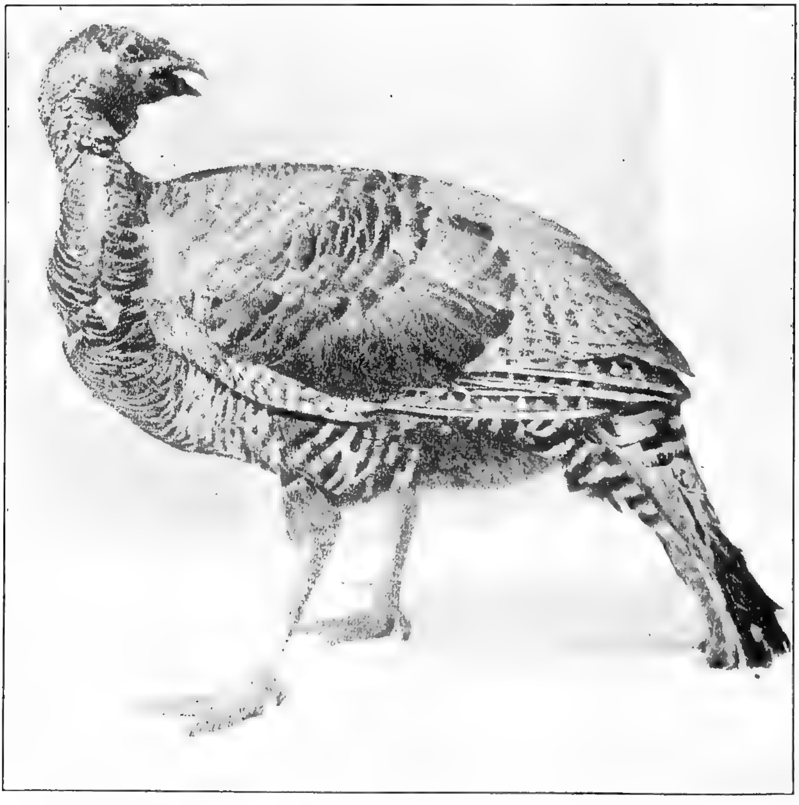

Fig. 19.
Pox on turkey—natural infection.

7 degrees C the vaccine is ready for transfer to the ultimate containers which are sterile bottles of amber or other dark glass. The vaccine may retain its potency for more than a month after preparation and on the other hand it may become less effective within two weeks. Therefore vaccine should be used as soon after preparation as possible.

"*Efforts to Standardize the Vaccine:* Our experiments have shown that the immunizing value of vaccine varies directly as the virulence of the virus contained therein. Since there is a variance in the virulence of different lots of virus there is necessarily a variance between different lots of vaccine. Thus far all attempts to devise a method of standardizing the virus in vaccine have proved unsuccessful. These have included the complement fixation test, inoculation of fowls with vaccine by scarification of the comb, and the intracutaneous injection of vaccine. The complement fixation test proved to be entirely inapplicable. Vaccine capable of producing marked lesions on fowls inoculated by scarification of the comb produced a higher degree of immunity in fowls vaccinated than vaccine capable of producing only mild lesions. At present, however, it is not possible to determine, by observing the lesions produced on fowls inoculated with vaccine, the degree of immunity it may be expected to produce in fowls vaccinated. The intracutaneous injection of vaccine gave no determinative reaction.

"*Efforts to Improve the Vaccine:*—Various attempts were also made to increase the efficiency of the vaccine by improving upon the method of preparation. The use of glycerine in the preparation of vaccine did not produce a more satisfactory product. Vaccine prepared in the usual manner, but not heated, proved to be an efficient immunizing agent, but it also produced disease in more than fifty per cent of fowls vaccinated. For this reason such vaccine cannot be used. A shake-extract of powdered virus was found to be an efficient immunizing agent when fresh, but it did not retain this property sufficiently long to make such a lengthy method of preparation practical. Powdered virus made in the form of "pills" and given subcutaneously conferred no immunity. The intracutaneous injection in the wattle of 1-10 mil doses of regular or shake extract vaccine proved to be a very efficient means of immunization. However, the development of lesions at the injection point and elsewhere about the head, and areas of induration at the point in the wattle make this method both dangerous and objectionable.

"*Method of Administration:*—The vaccine is administered subcutaneously. The dose is one mil for each bird. The most convenient place for administration is beneath the skin of the breast under the right thigh, the skin at that point being comparatively free from feathers. Special precautions must be taken that the vaccine is injected *just beneath the skin, not into the breast muscle.* The bird may be held either by the operator or by an assistant. *When the operator holds the bird,* the left wing is held back, the fowl is laid on its left side, and the right wing and leg and feathers held back with the last three fingers of the left hand. The exposed skin is then cleansed with a piece of cotton saturated with disinfectant solution (2 per cent solution of compound solution of cresol) and picked up with the thumb and forefinger of the left hand. Then with the right hand the syringe needle is inserted just *beneath the skin* and the proper dose injected. With a little practice one man with an assistant to catch the birds can vaccinate from 100 to 150 per hour.

"*When an assistant holds the bird,* both wings are grasped with the left hand and both legs with the right hand. The bird is then laid on its left side with the breast toward the operator. The operator standing a little to the rear of the bird, cleanses the skin at point of injection, picks it up with the thumb and forefinger of the left hand, and with the right hand inserts the syringe needle just *beneath the skin* and injects the vaccine. By this method a man with two assistants to catch and hold the birds can vaccinate from 200 to 300 per hour.

"A syringe of six to twelve mils capacity is well suited for this work. The needle should be 16 to 18 gauge and from 1½ to 2 inches over all in length. A screw needle is preferable.

"One treatment is usually sufficient in healthy or slightly infected flocks. In badly infected flocks a second treatment for all birds is advised. In very severe outbreaks the injections should be continued at intervals of 5 to 7 days until the disease ceases to spread.

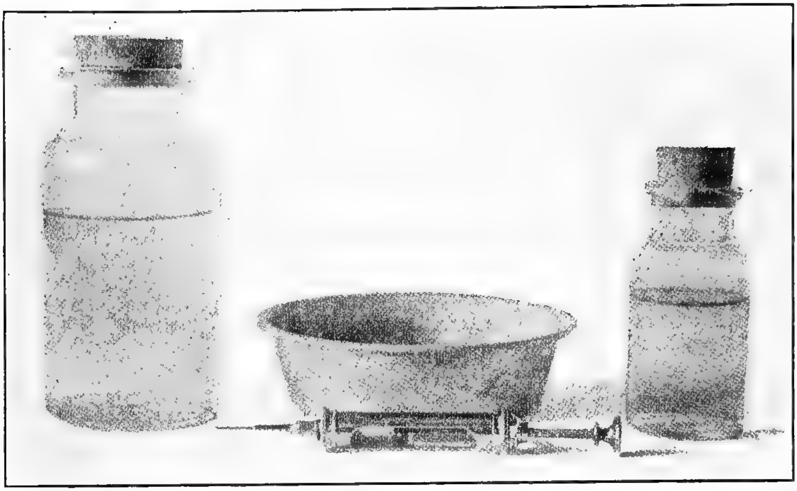

Fig. 20.

Apparatus required for vaccination: 1, Large bottle of vaccine. 2, Pan of disinfectant for cleansing the skin at the point of injection. 3, Hypodermic syringe. The syringe shown is of 6 cc. capacity and provided with a burr on the plunger to regulate the dose. 4, Small bottle of vaccine from which the syringe is filled.

"*Effect of Vaccination on the Fowls:*—Chicken pox vaccine if properly administered never has any harmful effect. We have occasionally observed a slight depression following vaccination which lasted for one or two hours, but as a rule there is no reaction. The vaccine has no harmful effect on the growth or development of growing stock and therefore it can be safely used on birds of any age. Vaccination does not influence egg production. There may be a slight degrease in egg yield following vaccination, but this is no greater than would result if the fowls were handled for any other purpose. Therefore there need be no hesitancy about vaccinating a heavy producing flock.

"*The Protective Value of Chicken Pox Vaccine:* We have found that partial or nearly complete protection against severe artificial infection with chicken pox virus may develop in two to six weeks after vaccination. Some lots of vaccine afford nearly complete protection while with other lots the protection is less marked, and with still other lots very slight. The amount of protection afforded was measured in all cases by comparing any lesions on vaccinated birds produced by the inoculation with those produced on an equal number of non-vaccinated control birds inoculated with the same virus. This variation in the protection afforded by different lots of vaccine is explained by the previously mentioned variation in virulence of different lots of virus.

"It would seem very probable, however, that the resistance to artificial infection produced by the vaccine is sufficient to protect against natural infection which could not be as severe as the artificial infection. A series of experiments were conducted in which an aggregate of twelve hundred and ninety-eight birds were used, two hundred and severty-two of which were naturally infected with chicken pox. Nine hundred healthy fowls were vaccinated and one hundred and twenty-six healthy fowls were not vaccinated. None of the diseased fowls were removed from the flocks after vaccination; thus affording every opportunity for the then healthy fowls to become infected. It was positively known that none of the healthy fowls had been previously infected with cricken pox. All fowls were leg banded and therefore an accurate record of the condition of each fowl could be kept. Frequent examination of each fowl showed the following: Of the vaccinated healthy fowls eleven per cent subsequently became diseased. Such results seem to us exceedingly good evidence of the protective value of chicken pox vaccine against natural infection.

"The results of experiments to determine the length of the immunity have indicated that it may vary from nine months to more than two years. Field observations show, however, that the immunity may last no longer than two or three months. On account of the uncertainty in regard to the longevity of the immunity produced, it is recommended that flocks be vaccinated only to prevent the spread of infection already present and not for the purpose of immunizing them against subsequent infection..

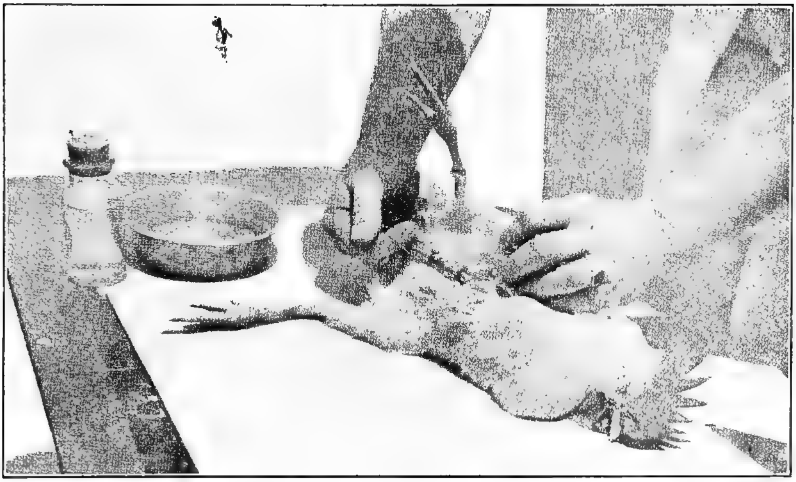

Fig. 21.

This figure shows the method of holding a fowl and administering chicken pox vaccine.

"*Conclusions:*—In concluding this discussion it is desired to emphasize the following points:

"1. As they exist in California, there does not appear to be any etiological relationship between chicken pox and those pathological conditions of the nasal passages commonly designated as colds, roup or swelled-head.

"2. Many so-called 'outbreaks of roup' may in reality be a disease manifested by symptoms very similar to roup, but due to nutritional factors.

"3. There appears to be ample evidence that chicken pox and those pathological conditions of the mucous membranes of the mouth and eyes commonly designated as canker or avian diphtheria are etiologically identical.

"4. Vaccine prepared from dessicated chicken pox virus while not conferring, in the majority of cases, complete protection against severe artificial infection does confer a considerable degree of resistance. This is shown by the mildness of lesions produced by inoculating vaccinated birds with virus as compared with those produced by inoculating non-vaccinated control birds.

"5 Chicken pox vaccine has proved to have considerable curative value when used on diseased birds.

"6. Chicken pox vaccine has proved a very effective means of promptly checking outbreaks of chicken pox and canker. The use of this product has become very general among poultrymen of California.

"7. The length of immunity produced by chicken pox vaccine may vary from two months to more than two years. For this reason the vaccine is recommended only to check the spread of the disease in flocks already infected.

"8. The efficiency of chicken pox vaccine is dependent upon the degree of virulence of the virus contained in it. Since there is considerable variation in the virulence of different lots of virus and there is at present no method of standardizing the virulence of virus, there is necessarily considerable variation in different lots of vaccine.

"9. It is realized that the present method of preparing chicken pox vaccine is very imperfect. Thus far, however, all efforts to devise a better method have proved failures."

This vaccine of Dr. Beach's is not available to poultrymen outside of the State of California. Most of the commercial vaccines which are on the market are not dependable. The vaccine may be obtained from the state departments of some other states, but we have heard of none that have met with the same success that Dr. Beach has.

ENLARGEMENT OF THE WATTLES

SYMPTOMS:—The wattles become enlarged and filled with a fluid or a pus, either as a result of an injury, cold weather or a disease.

TREATMENT:—Adopt general sanitary measures. Open the wattles at the lowest point. Squeeze out the fluid, or remove the pus or cheesy material. Place the wattles in cup of warm water to which has been added a little zenoleum, creolin, or some good disinfectant. Knead it gently with your finger until it appears to be thoroughly cleaned. In some cases cropping of the wattles is recommended.

ABSCESS OF WATTLES

Trouble of this sort is not uncommon. Make an opening in the lower portion of the wattle, so that it may discharge freely if necessary. Thoroughly cleanse the parts with hydrogen of peroxide and water, equal parts. If this does not prove effective, use full strength peroxide. After cleansing, dry the parts thoroughly and apply an ointment made by mixing one part finely powdered iodoform with twenty parts vaseline. Daily treatment will be necessary.

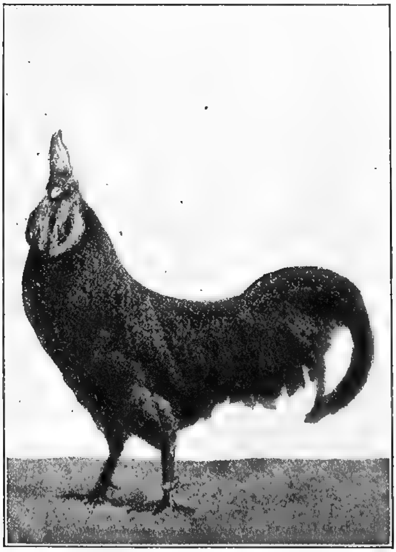

Fig. 22.
Enlargement or Dropsy of the Wattles.

QUESTIONS ON LESSON 26

POULTRY DISEASES, THEIR CAUSES, PREVENTION AND CURE

1. What are the principal causes of diseases of poultry?
2. Mention some of the essentials for prevention and for maintaining a healthy flock.
3. Why is it important to detect disease and diagnose it in its earliest stages?
4. What effect does breeding have on the health of a flock?
5. State briefly how you would make a post-mortem examination.
6. Why should the sick birds be isolated? How should they be housed and fed?
7. Should the buckets, fountains and pens used with sick birds be used with other birds? Why?
8. How would you proceed to give your poultry house a thorough cleaning and disinfecting?
9. How does chicken pox affect fowls?
10. If you should discover a bird with a frozen comb, what would you do in order to save the comb?

BLINDNESS AND STAGGERS

The above illustration shows a hen which was in good healthy laying condition, but lost her sight seemingly without cause. She was trained to eat and drink and move about in her room. She continued to lay for some time, until another disease caused her death. A post-mortem examination revealed the fact that a blood clot had formed at the base of the brain, which evidently caused her blindness. A severe knock on the head frequently causes an unsteady motion of the body or head and neck.

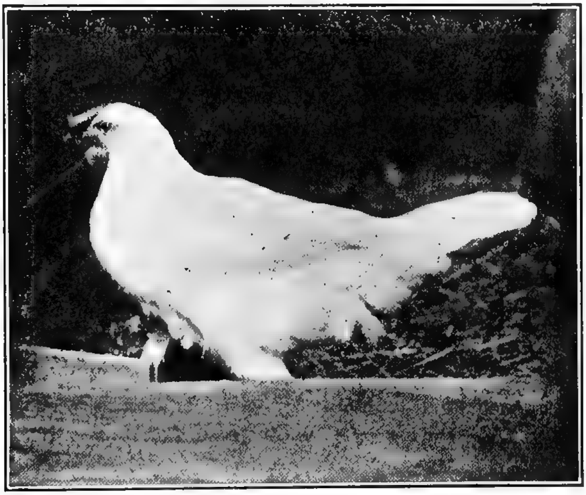

Fig. 23.

Blind hen, caused by a blood clot pressing on the brain. The clot may have been caused by a knock on the head or the rupture of a blood vessel.

BUMBLE FOOT

Bumble foot is caused by bruises on the bottom of the feet, too narrow or rough roosts, or an injury to the foot. If the roosts are too high and the birds are compelled to jump from the high roost to the floor, they often bruise their feet in this way. These bruises frequently swell and become filled with pus, and, if not lanced, the pus becomes cheesy and forms into a hard lump, which becomes a permanent enlargement. The pus cavity should be opened with a sharp knife, washed out with carbolized water, or some disinfectant solution or peroxide, and the entire surface of the cavity itself painted with a solution of nitrate of silver—10 grains to 1 oz. rain water. The foot should then be poulticed and wrapped, to prevent filth and dirt from getting into the opening which has been made. Keep the bird in a quiet, comfortable place until it recovers. If the blood flows too freely, tie a string tight around the leg to prevent the flow.

LEG WEAKNESS OR RHEUMATISM

The term "leg weakness" is sometimes used by poultrymen to indicate the lameness due to rheumatism in adult birds. The more usual use of the term "leg weakness" is to denote a disease or ailment which is found in growing chicks from one month to six months of age. It is said to be more common among cockerels than pullets, and is more frequent in the heavier than in the lighter breeeds. The chief cause of the trouble seems to be that in birds growing rapidly and fed heavily their weight sometimes increases faster than their strength. This results in a weak-kneed, wabbling bird. The disease is sometimes ascribed to other causes, such as over-crowding, close unventilated quarters, over-heating, forcing, or too much fattening food, etc. Salmon says: "It may develop in young chickens kept in brooders in which the heat is not properly distributed or where there is too much bottom heat, also in those which are kept constantly upon wooden floors." Regarding these cases, Robinson says: "Where such conditions are present the leg weakness is more likely to be an accompaniment of disease which plainly shows other symptoms."

The symptoms are indicated in the name of the disease. It first appears as an unsteadiness in the walk. This may gradually become worse until the bird is unable to stand alone and is constantly tumbling over. The birds are found sitting while eating and are inclined to walk very little. When the trouble first appears there is little else wrong with the bird. The eye and comb are bright and healthy, the appetite good. Later, however, the bird, weaker than the others, gets less grain and becomes thin, feathers out poorly and is an object in distress. It is said that rheumatism can be distinguished from leg weakness by the swelling of the joints in the former disease.

TREATMENT:—This consists chiefly, of course, in removing the cause. Since the most common cause is the overfeeding of fat producing foods, the amount of these should be reduced. The weak birds should be removed to a pen by themselves. Substitute bran, wheat and oatmeal for the corn and corn meal. Give skim milk, if possible, instead of water. Feed plenty of green food. This is one of the most important measures. Sanborn recommends rubbing the legs with tincture of arnica and adding one-half teaspoonful tincture of nux vomica to each quart of drinking water.

LEG WEAKNESS IN YOUNG CHICKS, DROOPED WINGS, SORE EYES, LOW VITALITY

Some interesting discoveries on treating leg weakness, drooped wings, sore eyes, weakness and low vitality in baby chicks have recently been made. Chicks often develop rapidly until the age of about 10 days, when suddenly a reaction will be noticed. In most cases green food is neglected with the result that many chicks die, while others frequently go into convulsions and the balance of the flock show signs of weakness. Tomato juice can be administered with exceptional results. In less than 24 hours every chick will show some improvement and practically the entire flock can be saved.

The Ontario Agricultural College has conducted an extensive experiment on the relative value of tomato juice in reducing the mortality among chicks and promoting growth. During March 2,000 chicks were hatched and placed in this experiment. Careful records of weights attained at successive periods during the growing period were registered and it was found that the growth of this lot was 13 per cent above the normal growth curve. It has also been found that tomatoes contain three of the essential vitamines found in our best foods. The acid in the tomato helps preserve those vitamines.

As far as poultry is concerned and the value of tomatoes as a food for poultry was discovered in the following manner:

"Two years ago the college authorities at Ames, Ia., were carrying on some experiments to discover how long calves would live and how fast they would grow if fed on cows' milk alone. The calves came along splendidly until they were about six months old when rickets, a malnutrition ailment that showed itself in a softening of the bones, would develop, and each affected calf would die in two or three days after the disease made its presence apparent. After several calves in the test had died, another one developed the trouble, and its death was expected. Accidentally or otherwise, a can of tomatoes was spilled into the feed of milk, and milk and tomatoes were given to the calf. The herdsmen were surprised next day to find it had recovered entirely, and was apparently as well and strong as ever. Tomatoes were mixed with the milk in feeding the calves from then on, and no more of the calves died.

"Rickets in calves and leg and wing weakness in chicks are kindred troubles, and what would prevent the one would likely prevent the other..

"In the above feeding tests, the first feed was made of equal parts of cornmeal and wheat shorts, moistened sufficiently with tomatoes—the kind you buy in tins at the grocers—to make it crumbly. The second feed was also cornmeal and wheat shorts, but moistened with equal parts of buttermilk and eggs. These two mashes were alternated for the first six or eight weeks, nothing else except buttermilk to drink being given. No scratch grains whatever were fed. The mashes were given on pieces of boards, some rolling into the alfalfa litter which covered the floors. This the chicks later found amusement and exercise in scratching for.

"Careful records of the weights attained at successive periods by the chicks were kept, and it was found that the growth of this lot was steadily 13 per cent above the normal curve.

"This increase in growth rate, of course, was most satisfactory, but there still remained the more important result that mortality was practically wiped out and no cases of leg weakness or drooping wings developed."

TOMATOES, EGGS AND MILK

It will be noted above that not only was tomatoes and tomato juice fed in the moistened mash, but a mash was also moistened with egg and milk. It is the yolk of the egg in most cases which is the most beneficial part of the egg in feeding for such results. In many cases, where chicks showed a tendency to low vitality, slow growth, drooped wings and leg weakness, we have been able to correct this trouble entirely by feeding milk and eggs beaten together and moistening a mash with it. In some cases it is necessary to force the egg and milk liquid mixture down a bird's throat if it is a valuable bird and individual treatment is justified. In addition to this, give tender lettuce, green clover or alfalfa, rape, kale or tender green feed, all the birds will eat. Now tomatoes are recommended and we recommend them especially in growing young chicks.

Ninety-nine times out of a hundred, if the chicks show signs of leg weakness, drooped wings, slow growth, or weakness of any kind after they are two weeks to two months old, the trouble is largely due to lack of tender greens, lack of vitamines, lack of proper food and nourishment, or to mites or overcrowding.

Among the most important, as well as most interesting discoveries made during recent years is the fact that there are certain substances, minute in quantity but absolutely necessary to nutrition, and to these substances the name "vitamine" has been given. They have never been isolated and we can only guess at their real nature. But the fact that tomatoes contain three of the four known vitamines is the reason that the chicks in the above experiments responded in such a marked degree to the use of tomatoes in their food.

VALUE OF VITAMINES

Poultry keepers of experience know the value of green vegetable foods for poultry. In giving advice we have invariably said to give the fowls all the green food they will eat in addition to their regular supply of grain. It has always been our experience, ever since we studied the subject closely, that green vegetable foods were necessary for the best results in egg production, in growth, and in bringing show birds to the highest state of perfection, but it has been only during the past few years, since we first became interested in vitamines, that we recognize an advantage in feeding vegetable food in addition to the assistance they afford to digestion, and the nutriment they convey. We were informed that vitamines are not found in the seeds of plants, at any rate in sufficient quantities to render them valuable on that account (and seeds of plants include all the grain, wheat, corn, etc., that is fed to fowls). We were informed that vitamines are to be found in the leafy portions of the plants and presumably in the so-called "flesh" of the tomatoes, and probably in the skins.

EXPERIMENTS WITH PIGEONS

Colonel Robert McCarrison, Fellow of the Royal College of Physicians, London, states that "the vitamines contained in natural foods are essential to health." He said there was an abundance of vitamines in fresh fruit and green, leafy vegetables, aud recommended eggs among other products containing vitamines.

"While in the Himalayas for a number of years, Dr. McCarrison said that with 400 major operations in a year, there were no cases of appendicitis or colitis. This was because the natives lived on natural foods. In making experiments in diet on monkeys, he found that the *devitamined* food resulted in degenerated tissues and a general breakdown in health. The instinct of the monkey was so strong for the right kind of food that it would try to discover particles of food not devitamined. Monkeys at the zoo in London had *turned away from delicacies to take cabbage leaves.*

"*Experiments on pigeons led to the same conclusions as to the value of vitamines. A pigeon fed on polished rice for* 15 *days lost its strength completely, but upon being given essence of vitamines, it recovered in less than* 12 *hours.*"

HATCHABILITY OF EGGS, AND STRENGTH OF CHICKS

Professor J. S. Hughes, J. B. Fitch and H. W. Cave, of Kansas State Agricultural College, "declared that the vitamine content of milk or eggs is determined largely by the quantity of vitamines in the feed given the cows or hen producing the milk or eggs."

"In other experiments they discovered that eggs of low vitamine content laid by hens fed on low vitamine food produce chicks that are not strong and vigorous. This fact, rather than the commonly blamed methods of incubation, may account for a large portion of the annual loss of half the eggs that the poultryman sets each year. Probably 300,000,000 eggs out of the 600,000,000 set each year in this country fail to produce strong chicks, and this represents a loss of over $12,000,000 a year.

"These results indicate that as a rule the animal organism does not synthesize vitamines, but must obtain them from its food. If this is generally true, as seems probable from the experiments reported, it will not always be sufficient that the mother is nursing her baby, but she must be sure that she is obtaining sufficient vitamine-containing foods.

VITAMINES A RECENT DISCOVERY

"Vitamines, or the lack of them, began to bother people's minds only a little over a decade age. At that time investigations were made of the disease beri-beri, which occurred among people who consume rice as their chief article of diet. It was found that the disease could be prevented by adding to the polished rice the polishings or surface layers of the grain which were removed by the modern milling methods just introduced.

"That the lack of something could make a person sick was a new idea. People had grown to believe that if they had kept out of the way of germs they would be safe. Now three well characterized vitamines are differentiated. They are the water soluble antineuritic vitamine, which Dr. Seidell is attempting to isolate, the fat-soluble, growth-promoting vitamine, and the antiscorbutic vitamine, which occurs in fresh cabbage, orange juice, tomatoes, etc., and prevents scurvy."

Let us repeat the advice which we have urged so often—give your chickens and mature fowls all the green vegetable food they will eat in addition to their ordinary rations.

NAKEDNESS IN YOUNG CHICKS

Some young birds have a tendency to grow bone and muscle instead of feathers.

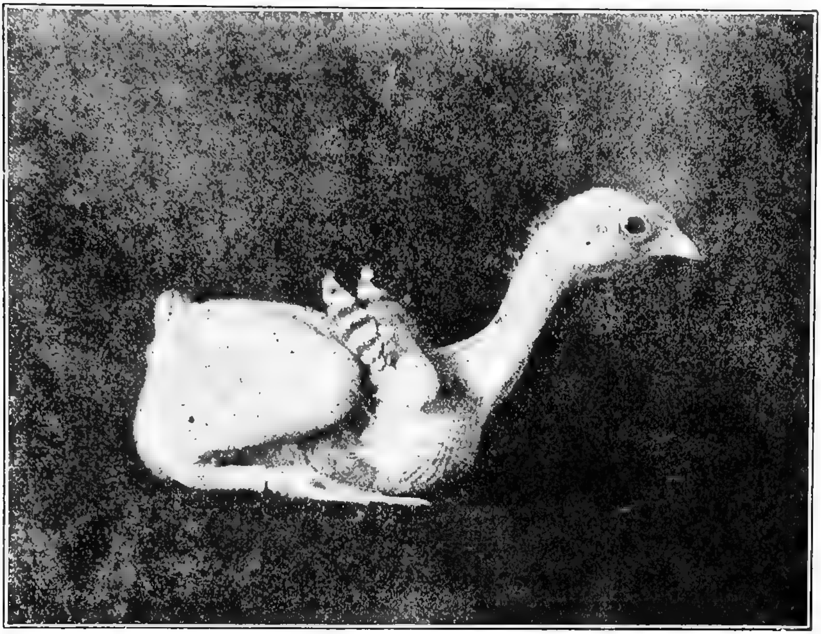

Fig. 24.

Featherless Chicks. Usually caused by breeding from immature stock, or breeding from male or female that was affected in the same way when a chick. They are always poor laying stock when mature.

This Barred Plymouth Rock is a very good example. However, it may appear in any variety of birds, especially when growing rapidly and while young.

This fault may be overcome partly by feeding, but the greatest influence is through the breeding stock, as some strains have a tendency to develop naked cockerels. This may be caused by breeding from immature stock. Never use a male to breed from that was thus affected. Feed plenty of bran, oats and other feather building materials. Mix a few drops of carbolic acid with vaseline and rub the skin of the bird several times a week. Such birds as this should be marketed as soon as old enough. Poor laying strains of any variety always have this fault to a greater or lesser degree. We never saw a cockerel so affected, breed any good layers.

BOILS ON THE SKIN

Where birds are slow to feather, we often find that some of the feathers curl up under the skin, which causes boils or running sores to form on the skin. The young, growing feather curls up and causes an ulcer or festered place in the skin. Never breed from such a bird. Rub the skin each day with a salve made of powdered sulphur and vaseline. Add 6 to 8 drops of carbolic acid to each tablespoonful of this sulphur and vaseline mixture. Rub the skin daily with it.

BALDNESS OF HEAD

Many people write to know if some mite or some disease is responsible for baldness of the heads of their females during the spring months. Of course, depluming mites could produce such a condition, but as a rule this is not caused by mites or disease, but is due to the vigor of the male bird in treading the females. This is seldom noticed except during the breeding season and usually occurs during the laying period. It is usually noticeable on the best laying hens. In all such cases, simply keep on the lookout for the real trouble, but I would not regard a few cases of this kind with any degree of seriousness. If you think it is due to a skin disease of any sort, then rub the parts with a salve made of vaseline and powdered sulphur, and add about ten drops of refined carbolic acid to each teaspoonful of the salve.

FEATHER EATING

This habit is usually caused by idleness of the fowl and improper methods of managing your birds. Encourage your fowls to take exercise by feeding most of your grain in a litter. Feed abundance of succulent tender green food. The birds should also have access to beef scraps or meat food of some sort, such as milk, sour milk or buttermilk or green cut bones. If these are not available it is a good idea to boil fresh bones and make a soup with which to mix a moist mash, which should be fed to the birds daily. Spade up a few shovels of earth occasionally and encourage the birds to work in that. If you find that the birds persist in feather eating, it is a good idea to tie a few small pieces of meat on the end of a string and hang the same from the roof so that the birds have to jump to reach them. As soon as the trouble is noticed it is a good idea to go into the pen and try to spot the birds that have formed the habit, and take a sharp knife and trim both lower and upper parts of the beak until they bleed just a trifle. Make the point of the beak square and blunt so that the birds can not get a firm hold on the feather in the attempt to pull same. Discourage idleness all you can, and if you follow the above directions it will break the birds of this ugly habit of eating feathers. Feed liberally.

EGG EATING

This is rather a bad and expensive habit, and if it develops to any extent it is usually the fault of the poultryman himself. The nests should be kept supplied with a liberal supply of nesting material of some sort so that the eggs will not break when they are laid. The nests should also be protected from the light by being placed and kept in the darkest part of the room. Never allow your nests to be placed on or near the floor where the eggs must continually tempt the hens, and where there is danger of the birds coming in contact with broken or soft shell eggs. If your fowls have developed this habit, place a few china or artificial nest eggs about the floor of your poultry house so that the hens can work at these. Blunt the beak of the birds that have developed this habit by trimming the point until the beak is square and blunt. Give a good supply of a good grade of oyster shell, limestone grit, and provide the birds with tender, succulent green food, and meat food of some sort. If necessary, you may provide your birds with lime water as a drink. Milk, buttermilk or sour milk are also beneficial in such cases. Encourage activity and feed liberally.

In some cases we have found by feeding the birds liberally on dry or ground up egg shells, they will soon overcome this habit. Save the shells of eggs that are used for cooking purposes or even the shells of infertile eggs that have been in incubators; dry these thoroughly so that they will become crisp and will crumble easily. Mix the particles of the broken shells with the dry mash given the birds.

FAVUS

This is a disease that affects the comb, face and wattles. It starts by a crust forming on the unfeathered portion of the head. It often extends down onto the feathered portion of the head and neck and in the region of the vent. The feathers fall off, and the head and neck and patches around the vent become bare. A peculiar odor can be noticed, resembling must or mold. When the disease first starts you do not notice much change in the general health of the fowl, but as the disease progresses, the bird will begin to go down, will lose its appetite, will grow thin and finally die. It is caused by a fungus.

TREATMENT:—Remove as much of the crust as you can, using the back edge of a knife or a spoon handle. Before doing this, soften the scales with water, or by rubbing on oil or glycerine. The parts should then be painted with tincture of iodine. A mixture of equal parts of lard and sulphur, with a few drops of refined carbolic acid mixed in, will make a good salve which should be rubbed on the affected parts and around them. Use this once a day. The disease is contagious and the affected birds should be removed from the flock, and every precaution taken to prevent the spread of the disease.

DIAGRAM SHOWING THE INTERNAL ORGANS OF A HEN

1. Is tongue and glottis at the back.
2. Esophagus.
3. Crop.
4. Stomach and Proventriculus.
5. Gizzard.
6. Pancreas.
7. Liver.
8. Intestine.
9. Caeca.
10. Rectum.
11. Cloaca.
12. Kidneys.
13. Trachea, or Windpipe.
14. Lungs.
15. Heart.
16. Spleen.
17. Ovary.
18. Funnel of oviduct.
19. Albumen section of oviduct.
20. Isthmus of oviduct.
21. Shell forming section of oviduct.

This picture is from a photograph of the internal organs of a hen as they were spread out, showing the relative size and length of the different organs. It must be noted, however, that some organs, such as lungs, kidneys, etc., collapse upon being removed from the body so that they are not as large as when in the body.

Three important points are clearly shown. First, the relation of crop (3); stomach (4); gizzard (5), and pancreas (6). Second, the relation of the different parts of the egg producing organs, 17, 18, 19, 20 and 21. Third, that the cloaca (11) is the common opening for 10, 12 and 21.

No. 1 is the tongue and glottis; the tongue is used to move food about in the mouth, throws it back into the esophagus and aids in drinking. The glottis is the opening from the mouth into the trachea or windpipe and helps to control the voice.

No. 2—The esophagus is a tube-like passage for the food to pass from the mouth into the crop and from the crop into the stomach.

No. 3—The crop is an enlarged part of the digestive tract where the food is stored and mixed with liquid until the harder parts are softened; from here it gradually passes into the stomach.

No. 4—The stomach (proventriculus) corresponds with the stomach in the human being, as the gastric glands are located here. These glands secrete the first digestive fluids, pepsin and hydrochloric acid, which act upon the food.

No. 5 is the gizzard, where the grinding or crushing of the food is done. Here the digestive fluids continue to act upon the food and the entire contents are mixed into a pasty mass.

No. 6 is the pancreas, the gland that secretes the digestive fluids which, with the bile, completes digestion.

No. 7—The liver is the largest gland in the body. It secretes the bile which aids digestion, emulsifies and saponifies the fat. The liver is also spoken of as the storehouse of food. Sugar in a certain form is one of the foods thus stored, which is later used as food for other parts of the body.

No. 8—The intestines and (9) caeca are principally for the absorption of the nourishing parts of the food, although a great part of the digestion takes place in the first part of the intestines.

No. 11—The cloaca or common opening into which 10, 12 and 21 empty. The contents of 10 and 12 are usually voided together, the white, chalky portion being from the kidneys.

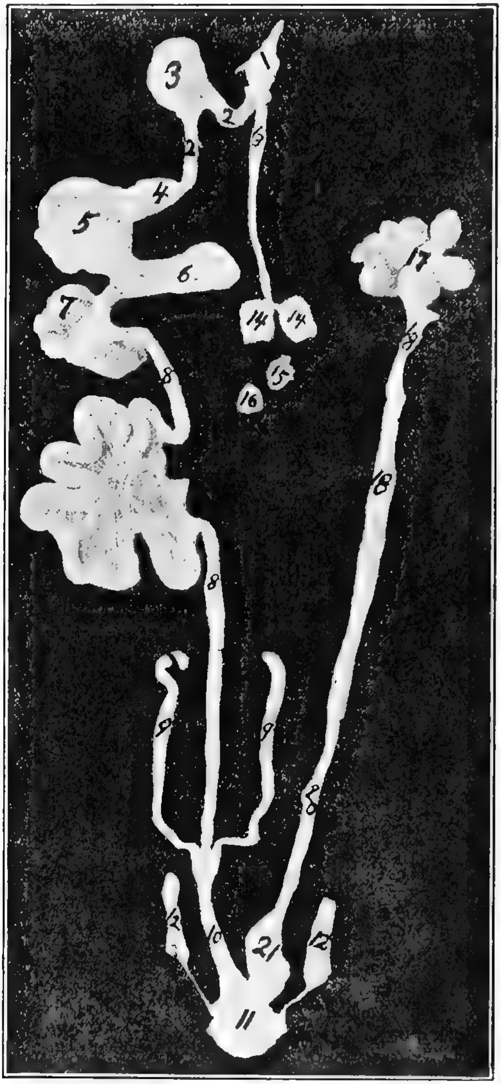

Fig. 25.
The internal organs of a hen.

No. 12—The kidneys, which take up and cast out many impurities from the body; mostly nitrogenous substances and salts.

No. 13—The trachea, which conveys the air to and from the lungs, (vocal cords).

No. 14—The lungs, where the blood is purified.

No. 15—The heart, which pumps the blood to all the different parts of the body.

No. 16—The spleen is the least known organ of the body, but is thought to be the place where red blood corpuscles are buried, repaired or manufactured. It is also one of the great glands to produce anti-bodies or antitoxins to protect against disease.

No. 17—The ovary is where the ovules, or yolks of eggs are developed.

No. 18—The funnel of the oviduct, which picks up the yolks as they are freed from the ovary.

No. 19—The part of the oviduct where the albumen or white is secreted and placed around the yolk.

No. 20—The isthmus of the oviduct is where the soft shell is placed around the egg.

No. 21—Uterus, the section of the oviduct where the hard shell is placed around the egg.

No. 22—Vaginal portion of the oviduct, which contains the so-called sphincter muscles which protect the contents of the cloaca from passing into the uterus.

THE TRACHEA OR LARNYX AND HOW THE VOICE OF THE FOWL IS PRODUCED

"C" is the opening of the larynx and is just back of the base of the tongue.

"A" is the membraneous or muscular part of the opening which contracts and closes the opening when food is swallowed. It corresponds with the epiglottis in man. The contracting and closing of these muscles and the relaxation and the opening have some influence on the voice. It modi-

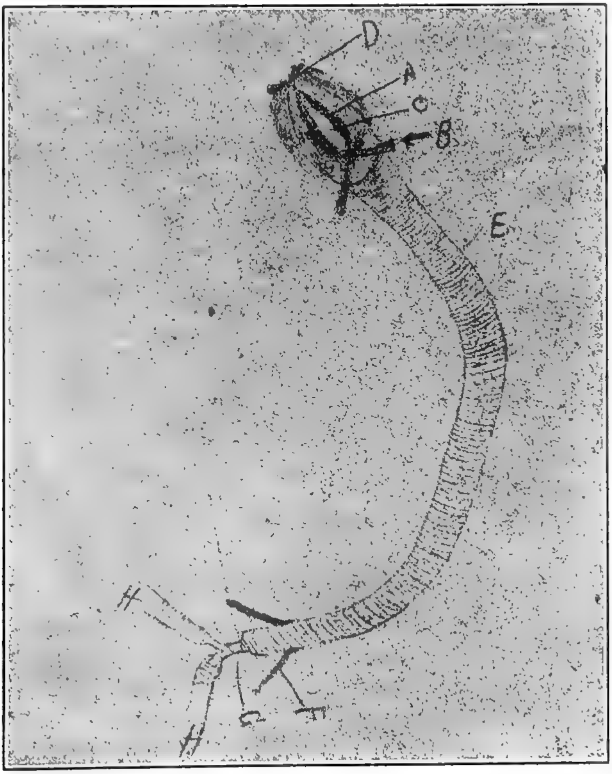

Fig. 26.
Trachea.

fies the sound. It is the opening and closing of this membrane and the opening and closing of the mouth, with the extension or lengthening or shortening of the trachea by which the sound is modified that make the cackle or the "ka, ka, kea" of the hen or the crowing sound of the rooster. The membraneous or muscular part ("A") does not produce the sound, as is commonly supposed by most persons, but this simply aids in controlling the sound, much the same as the lips of a human. The tube-like part of the trachea is made up of cartilaginous rings attached to each other by thinner membranes as seen at "E." This allows the trachea to be made longer or shorter and this aids in modifying the sound or voice. The sound is not produced by vocal cords at the opening of the larynx, but it is produced by constriction at the lower end of the trachea at "G." It is just before the bifurcation into the two large bronchi. The rapid passing of air through this constriction produces the sound or voice. In geese and ducks there is, in connection with the construction, a dilation to produce more volume of sound.

"F" is a muscular attachment. As the muscles contract the trachea lengthens, and as said before, the voice modifies in this way to some extent.

"D" and "B" are also muscular attachments and aid in opening and closing the trachea, and in drawing up the trachea to lengthen it.

CROUP, BRONCHITIS OR PNEUMONIA

SYMTOMS:—With these diseases there is an inflammation of the mucous membrane of the throat and bronchial tubes. You will notice the the bird breathes rapidly and often makes a rattling, bubbling, or whistling sound. In very severe cases the bird may breathe with some difficulty, refuse to eat, and wings droop. It may be caused by exposure to cold. drafts or dampness. It may result from inhaling dust.

TREATMENT FOR BRONCHITIS AND PNEUMONIA

One of the best remedies we have ever used for Bronchitis, Pneumonia or an apparent irritation of the throat and bronchial tubes is an ointment made as follows:

Fry four mullen leaves in one and one-half tablespoonfuls of lard and one-half tablespoonful of tallow. If you haven't tallow then use all lard. After the mullen leaves have been fried and the mixture allowed to cool until it is in a luke-warm state then we mix in one teaspoonful of Turpentine, one teaspoonful of Camphor and one teaspoonful of Iodine. See that this is thoroughly mixed with the lard, etc., then rub the throat each night and morning, both inside and out, with the mixture.

In case of Pneumonia it is also a good idea to rub some of this remedy underneath the wings and just over the lungs. This seems to help cases of Bronchitis and Pneumonia when nothing else does. Also rub these parts with a mixture of pure lard and Turpentine. This will sometimes prove quite beneficial. Use about one-half tablespoonful of Turpentine to each tablespoonful of lard. Melt this and see that it is thoroughly mixed before applying.

OTHER TREATMENTS:—Keep the bird in a comfortable, dry room or coop which is well ventilated. Lots of pure, dry air will do as much to relieve these diseases as any treatment you can give. Feed a mash moistened with milk. We make a mixture in the following proportions: To each teaspoonful of castor or olive oil we add ten drops of turpentine and five drops of either syrup or wine or ipecac. Mix well and give one teaspoonful twice a day until the bird shows signs of improvement. This trouble is very difficult to control or relieve. Don't give oil to the extent that you purge your birds too freely.

You can also cure some of the cases by giving tincture of aconite, one drop to each fowl, every two hours. Put the food containing aconite down the bird's throat if necessary. Drop the aconite in a little mash and feed every two hours.

In case of pneumonia, it is advisable to raise up the wings and paint the skin, just over the lungs, with tincture of iodine. To stimulate the birds, it may be necessary to use two drops of spirits of camphor and ten drops of brandy in a teaspoonful of warm milk three times a day.

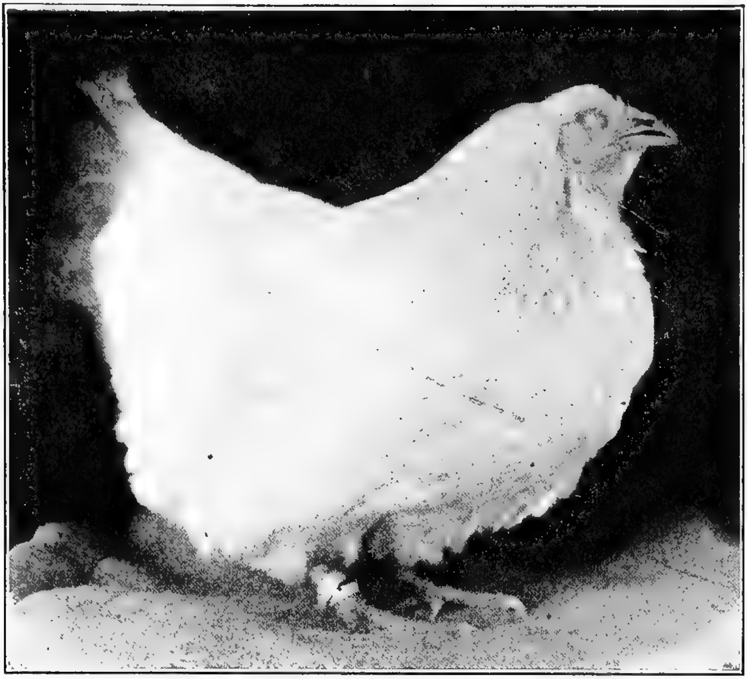

Fig. 27.
PNEUMONIA.
A fine, large hen which has contracted pneumonia because of exposure and damp roosting quarters.

If you cannot get the rattle in the throat stopped in any other way, we advise putting a little powdered sulphate of iron (copperas) in a glass tube or paper rolled up to form a tube. Blow this into the bird's throat. Also keep a preventive in the drinking water at the time this remedy is used.

COLDS, CATARRH AND ROUP

We doubt whether at any one place in the world have there been more roup remedies and preventives tested and experimented with than we had tried out at the Missouri State Experimental Station. Roup is one of the sources of loss of mature fowls. Much of this trouble can be avoided by proper methods of prevention.

We believe that serums can be made so that flocks can be inoculated and made practically immune to roup. We have been testing out something along this line, but have not arrived at any definite conclusion, except that we believe this is the only sure way of really preventing and curing a large per cent of the cases of roup.

As we have often stated, we do not recommend doping your fowls with anything so long as they show no indications of disease, but if you have many cases of roup we recommend the use of the treatment which we have found to be most effective. These remedies can be used with considerable success until such time as we are able to develop a serum or some more simple and practical method of prevention and treatment.

SYMPTOMS:—Common colds are caused by exposure to cold, damp winds, stormy weather, drafts, overcrowding, poorly ventilated houses, and other similar causes. When colds first appear, you will notice the birds sneezing, bubbles in the corners of the eyes, a watery or sticky discharge from the nostrils and eyes, which the birds persist in wiping off on the feathers of the neck. If this is not attended to, the birds treated and the cause removed, it may result in roup. With genuine roup there is usually an odor about the head of the affected bird. Sometimes the eyes are swollen shut or the lids are stuck together. In this case a cheese-like mass sometimes forms under the lids, and if the lids are not opened and this removed and kept washed out, it will destroy the eyesight entirely. The face of the bird is sometimes swollen and a tumor forms on the side of the face between the eye and the nostrils. Roup is a very infectious disease, and all sick birds should be isolated.

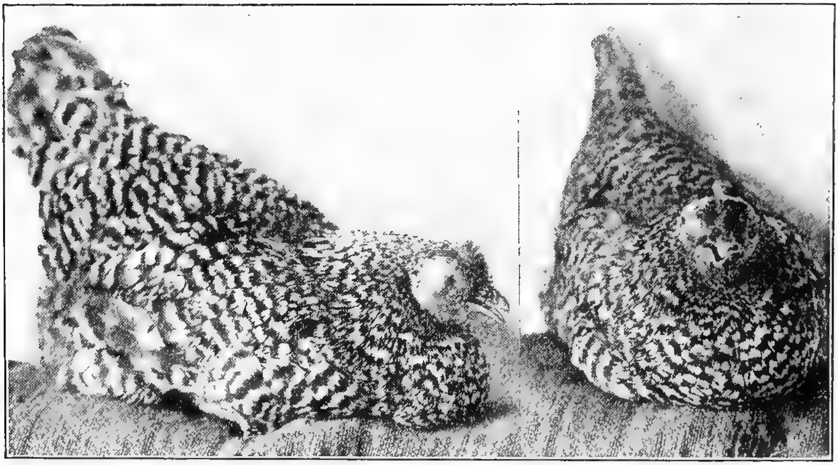

Fig. 28.
A genuine case of roup. Eyes swollen shut and a very offensive odor about the head.

TREATMENT:—When the cold or indication of roup is first noticed the bird should be treated as follows: Take the nostrils between the thumb and forefinger and press them together, gently moving the fingers toward the beak. Also press between the nostrils and eyes in an upward manner. This loosens the discharge and presses a great deal of it through the nostrils and clears the head of the bird ready for treatment. We also press the finger against the crevice in the roof of the mouth and remove all the mucous possible. We next plunge the head into a pan of warm water, to which has been added creolin or zenoleum (one teaspoonful to a pint), permanganate of potash or germozone until the water becomes a deep wine color.

We prepare the permanganate of potash by taking a pint bottle and filling it about one-fourth full of these purple crystals. We pour in enough water to nearly fill the bottle. We shake this mixture until the crystals are dissolved. When ready to treat a bird, we pour in enough of this to turn the water a rich wine color. We have found germozone, made by the Geo. H. Lee Co., of Omaha, Neb., more effective than permanganate of potash. Zenoleum is one of the best disinfectants

The head is kept under the water for twenty or thirty seconds. By this treatment the solution is distributed through the nostrils and canals. It should be given once a day or at least every other day until the symptoms have disappeared. Grip the legs and wings of the fowl with one hand so the pan cannot be kicked over and dip the head with the other hand.

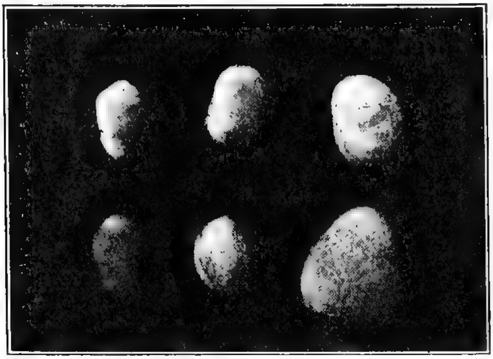

Fig. 29.

Growths of cankerous accumulations which were taken from the swollen eyes of chickens which were suffering from roup. This accumulation must be removed each day from underneath the eyelids and the eye treated by dropping into it two or three drops of undiluted zenoleum or a solution of equal parts of creolin and water. If such cases are not taken in time the bird is apt to lose the eye entirely.

SIMPLE REMEDIES FOR COLDS AND ROUP

There is a remedy that has proven very valuable and simple in many cases. After the nostrils, eyes and face have been thoroughly cleansed, use a 25 per cent solution of either argyrol or silvol (organic silver salt). After the cleansing has been done wait a few minutes before applying the oily solution. The silver salts do not coagulate albumen, they will absorb and destroy germs and bacteria. This often proves a very efficient remedy in treating diseases of the nostrils and throat. It is used in treating human beings with great success, and can also be depended upon in many cases of colds and roup in chickens.

DIPHTHERETIC ROUP

We have found that the treatment of poultry very much resembles the treatment of human beings. In cases where one patient may respond to one remedy, another patient may not be influenced by it to any noticeable degree, and for that reason we give several different remedies which we have found beneficial in various cases.

We have found some cases of roup where nothing that we have used would give any results until we have tried out the following remedy recommended to us by Dr. B. F. Kaupp, of the North Carolina Experiment Station, which we have found to be very beneficial in many instances:

"If a bird is not a valuable one, it is better to destroy it. It is well to remember that the head as well as the body be buried deeply, or better, burned.

"Thorough cleanliness and disinfection of the buildings is essential. The germs of the disease can be carried on the hands, clothing, feeding utensils or on the feet of animals.

"Always quickly isolate the sick birds. If it is desired to treat the sick bird and to obtain the best results, it will be necessary to first procure a syringe with a strong bulb so as to force the liquid through the nasal canal. An ordinary medicine dropper bulb does not give force enough. Syringe out the parts with a 20 per cent solution of common baking soda. After a few minutes this will be found to have dissolved the mucous. Next syringe out the parts with equal parts of peroxide of hydrogen and water.

This will thoroughly cleanse the parts and prepare them for the drug calculated to destroy the germs and allay the inflammation. Inject a quantity of the following:

Oil Thyme	30 minims
Oil Eucalyptus	20 minims
Menthol	10 grains
Oil Petrol	2 ounces

Mix thoroughly.

"All liquids injected into an inflamed mucous membrane should be warm. The material can be warmed by setting the bottle containing the mixture in hot water.

"Treat the eye in the same manner as the nasal type and touch the ulcers in the mouth with a stick of nitrate of silver (lunar caustic)."

OTHER ROUP REMEDIES

We have also found it very beneficial to use the following mixture in the nostrils when the colds first appear: Undiluted zenoleum or a solution of equal parts creolin and water, or germozone as per directions.

Clean out the nostrils and head well before using the above remedy, then treat once a day or every two or three days in mild cases. It is good to bathe the head in warm water, to which has been added a little of the zenoleum, creolin, or germozone as before recommended. After the nostrils have been cleaned and the head dried, inject a little of the above mixture into the nostrils and work it well back into the head. If the bird's eye is affected remove all the mucous and canker from the eye and then put a few drops of undiluted zenoleum into the eye, or two or three drops of a solution of two parts water to one part of creolin.

COMMERCIAL REMEDIES

One of the most effective ready prepared remedies we have used is the roup remedy sold by the American Poultry Supply Company of Kansas City, Mo., also the Coldene and Pipene sold by the Licene Manufacturing Company of Chicago. They guarantee a cure of most cases.

Serums are being made for the treatment of roup in poultry along the same line that serums are made for the treatment of cholera in hogs. None have yet been perfected to a degree that we would like to recommend them, but this will eventually be the solution of the roup problem.

TAKE PREVENTIVE MEASURES

Upon the occurrence of an outbreak of roup, the first thing to do is to take steps to check it as quickly as possible. All affected birds should be removed at once from the remainder of the flock to a place that is clean, dry, well lighted, comfortable, well ventilated, and which can be thoroughly disinfected after the disease has run its course. Remove the littler from the houses and disinfect the house and runs thoroughly with zenoleum or creolin mixed according to direction, or with a 5 per cent solution of carbolic acid. We have tried out and tested practically all the serums, "graranteed roup cures" and remedies of various kinds recommended for roup. But we have come to the conclusion that the safest and best thing for any poultry raiser to do is to use all possible means to prevent the disease. This can best be done by breeding from healthy stock, providing comfortable houses which admit an abundance of ventilation and sunshine. The houses and yards must be dry. Ventilation, without drafts, is the best preventive. By all means have an opening near the floor to take out the bad air, if it is nothing but the exits for fowls left open or covered with wire to permit of the circulation of air. So in addition to your shutter, curtain or open front also have small openings near the floor in the front of the house to complete the system of ventilation and to take off the bad air. Be sure the floor and walls of the house are dry.

FORMULA A1

Recommended by Tom Barron of England

The following mixture is a great corrective and preventive. It is one of the best things we have ever used for the correction and prevention of roup, canker, chicken pox and other diseases. It should be used frequently in the fall before putting the birds into winter quarters and should be used throughout the breeding season.

Mix in the following proportions:

Magnesium Sulphate	10 oz.
Magnesium Oxide	1 oz.
Sulphate of Iron	2 oz.
Ground Ginger	2 oz.
Sulphur	3 oz.

Give one tablespoonful in moist mash to 12 birds each morning for three mornings and discontinue for two weeks, then repeat.

The magnesium sulphate acts on the intestines; the magnesium oxide on the kidneys; sulphate of iron acts on the blood; the ground ginger stimulates all organs, and the sulphur is a general antiseptic. This is therefore a good tonic for the fowls.

For serious ailments the dose mentioned above should be increased. Make a ball the size of the end of your finger, mix with a little mash and force down the bird's throat.

No one, however, should ever try to control a disease without first removing the cause.

We know that sulphur is one of the best antiseptics that we have. If you can't do anything more we advise you to add to each gallon of your dry mash or moistened mash, four heaping teaspoonfuls of sulphur, mix thoroughly and repeat two or three times a month during the breeding season and during the cold, damp days of fall and when the birds are first put into winter quarters.

TUMORS CAUSED BY ROUP

If the bird has a tumor on the face caused by canker and pus forming under the skin, it is best to open this with a sharp knife and let it bleed freely and work out all the contents that you can. Wash this out with the zenoleum and water or some other good disinfectant, then put some powdered alum and sulphur into the place where the incision has been made. Also place a small piece of absorbent cotton in the incision. The bird should be fed a good stimulating mash, moistened with sour milk or water. If the bird's eyes are swollen shut and it cannot see, then force a little of the feed down its throat for a few days. Dip its bill in water so that it may drink. At least see that it gets food and water until it begins to recover and is able to see to eat. If the bird is very low in vitality and thin in flesh, about the best thing you can do is to kill the bird and burn it.

The best treatment for roup and kindred diseases, is prevention. The disease can be prevented by stopping all sources of infection. Some things to keep in mind are:

"1. Do not make tender house plants of your birds at night, as they will contract cold during the day.

"2. In introducing new birds always procure them from uninfected flocks.

"3. Isolate all new birds and all birds that have been exhibited at shows for two or three weeks to make sure that they do not develop the disease.

"4. Exclude from uninfected houses and yards poultry and all other animals, including men, coming from those that are infected.

"5. Do not use implements, as hoes, shovels, etc., that have been used on infected premises.

"6. Keep the birds in a good hygienic condition, well nourished and in dry, well ventilated houses and roomy yards.

"When the disease has been introduced into the flock careful precaution may prevent its spread.

"1. Immediately separate from the flock any birds that show symptoms of the disease.

"2. Disinfect the yards and houses. A 5 per cent solution of carbolic acid may be used on the yards. Remove the litter from the houses and disinfect freely. This 5 per cent carbolic solution may be followed by whitewash.

"3. Use pure drinking water in clean vessels.

"4. Keep watch on the flocks, so that any new cases may be isolated at once.

"5. Burn or bury deep all birds that die."

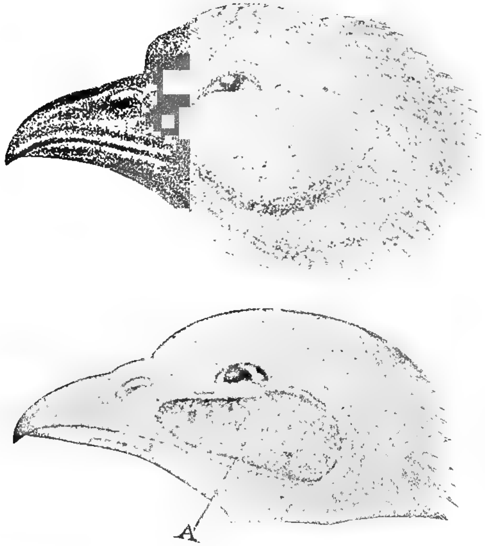

Fig. 30.
From Megnin.
The lower figure shows the maxillo-ocular rinus, which opens into the socket of the eye, and communicates with the nasal cavity. The upper figure shows the roup tumor on the head caused by the filling of this cavity with cheesy pus. If the tumor is large, we usually open it and after we have pressed out as much as possible, then fill the cavity with equal parts of powdered alum and sulphur.

If the parts affected by roup are painted with water soluble iodine, being treated once a day, will usually effect a rapid cure. Or, a famous English remedy for roup and colds is the use of a 5 per cent solution of Cargentos. The affected parts are treated with this by dropping some of the solution into the eyes, nostrils and crevice in the roof of the mouth. Some poultrymen in this country claim this gives them splendid results.

CANKER

This is a disease that is quite common among poultry in the fall, winter and early spring. We have experimented with many different remedies and also with methods of prevention. A bird that has recovered from canker and that was never seriously sick with this disease can be used as a breeder. A vaccine or serum is now being made that will cure this disease.

SYMPTOMS:—There is usually a yellowish cheesy fungus growth on the tongue, mouth or throat. There may be a rattling in the throat and the bird may have difficulty in breathing or swallowing. The bird usually has considerable fever, and just before this cheesy growth forms you will notice that it is always preceded by a thick slimy mucous in the mouth. These spots of canker are sometimes an indication of digestive disorders, or may be caused by one bird picking another in the mouth while fighting, or by the litter in which the birds scratch being moldy and damp, or is thought to be related to roup or kindred diseases.

First see that the bird is not constipated. In fact, it is a good plan to give three-fourths to a teaspoonful of epsom salts to each. This is the first thing to use in the treatment or as a preventive.

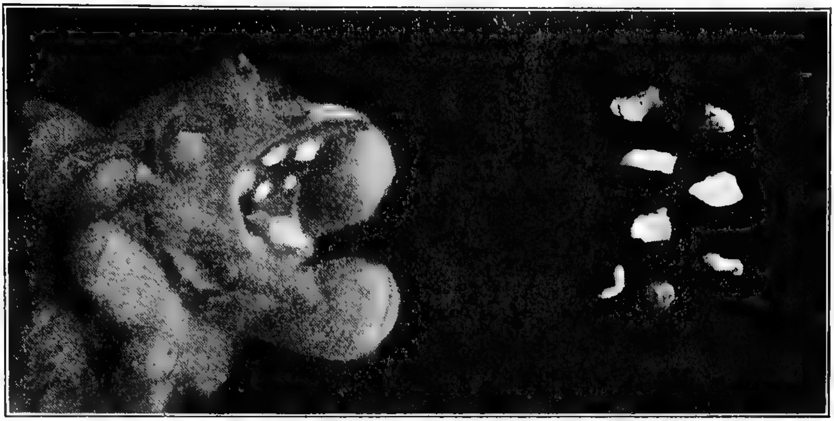

Fig. 31.

CANKER.—This shows a bad case of canker. You can see the whitish or yellow patches on the mouth or tongue and some of the particles which have been removed. These patches must be removed with a dull knife or a sharp splinter. Then treat as directed.

Control:—It pays to treat only birds that are slightly diseased or that are valuable. It is better to kill affected birds by wringing their necks. Burn all carcasses and disinfect poultry houses and ground. Use one 7.3 grain mercury bichloride tablet per gallon drinking water in a non-metal container. These are not used more than ten days at a time. Also feed in wet mash every other day as much of the following mixture as the birds will eat in ten or fifteen minutes: 1 part Epsom salts, 1 part dry powdered sulphur to 12 parts dry mash.

TREATMENT:—It is necessary that these spots of canker be removed from the tongue or mouth before you attempt to treat the disease. We remove the canker by using a clean sharp splinter or a dull knife. Before removing the spots of canker it is advisable to paint the spot with iodine and allow this to remain on for two or three minutes. Then remove the canker from the mouth, throat or tongue. The cankerous growth will often accumulate in the throat, windpipe or trachea, and prevent the bird from breathing, and it will die for that reason. In such cases it is necessary to be prompt in discovering it and in removing the canker from the trachea. If you notice a bird opening its mouth as if gasping for breath or hear it making a wheezing sound as it breathes, you had better catch the bird and examine its throat carefully for canker. Look down the trachea for these yellowish patches. If they are not removed they may grow to such size that the bird cannot breathe and death results.

Do not be alarmed if the sores bleed a little after the spots are removed. First give a good purgative. Remove the yellowish accumulations and touch the spots with powdered alum, creolin, zenoleum or iodine. Repeat that operation every second or third day if necessary. A clean feather or swab or camel's hair brush may be used for this purpose. If the canker accumulates very rapidly, it may be necessary to remove it every day.

One of the best remedies we have used for canker is the following:

Iogen (surgical dressing powder)	one part
Boracic acid	six parts

Mix thoroughly. After the canker has been removed take a clean stick or swab and rub the mixture on the spot which is affected. If the canker is in the trachea, or windpipe, remove the canker and apply the powder by blowing it through a goose quill, glass tube or powder blower. It can be blown down into the trachea with the blower. Be sure it reaches the affected parts. This has proven to be effective.

CANCEROUS CANKER

One of Leavenworth's prominent poultrymen conducted some experiments with poultry diseases and we quote what he had to say concerning his tests:

"Just getting over a hard fight with chicken pox and canker, and thought possibly you might be interested in the many experiments carried on at my experiment station—my basement.

"I waded through every poultry disease book I have to find some dope on chicken pox, and believe me I was simply disgusted at the treatments suggested. Most of them recommended some patent remedy, and in nearly every case they said, 'Rub some kind of dope on the sore,' and that was all. Some suggested removing the scab and painting the sore, but NONE SEEMED TO TAKE THE THEORY THAT IT IS A BLOOD DISEASE.

"Now I don't think I've discovered anything new in my treatment, but I've proved my theory that it is a BLOOD disease. Three years ago I used calcium sulphide, 2 grains a day per bird, in capsules and cured all of our birds. This year I painted the sores with creolin and used the sulphite in the mash, two grains per bird, thoroughly mixed in the mash and it worked wonders. Calcium sulphide is one of the best known blood purifiers. I got the idea from Stewart's calcium wafers, which are advertised extensively in the newspapers as a blood purifier, and figured that what was good for people would also be good for chickens. So now, I've got a real chicken pox remedy and a sure cure.

"I've had a lot of trouble with canker, and though I haven't seen anything in poultry disease books about CANCER, I am convinced chickens have such. The statement in some poultry books that colds, canker, catarrh and roup are symptoms of the same disease, I think I have proved entirely wrong, for I have had some cases of canker wherein the patient had absolutely no symptoms of a cold. In your disease book I find you are the only one of the many authorities who takes the position that canker can be caused by something other than a cold. Some of my birds had no sign of colds, yet had plenty of canker. In working with them I found that the phlegm came up from the crop and filled their throats and even went into the windpipe, almost choking the fowls. I began to doctor for sour crops, indigestion, etc., and I think I have struck it in giving a good dose of castor oil and then doping the water with Lee's Germozone, but I think permanganate would do just as well.

"Some cases of canker I painted with iodine; others with tincture of iron, creolin, etc., and even used the nitrate of silver. The last named proved the most effective, but one has to be careful not to get it too strong.

"However, I've found some real CANCER; a fibroid cancerous growth that, instead of building up, eats into the flesh. Have one hen and a cockerel that have it, and it has been the toughest proposition I ever tackled. Think I have it beaten in the cockerel, for it was so far cured that I sent the bird to Kansas City this week and got third with him. It came in a corner of the mouth and ate down into the flesh and back toward the eye. I used tincture of iron on it, but each day had to dig out the cancer with an orangewood stick sharpened on one end like a chisel and the other drawn to a point that I used to trace down the small fibrous strands like threads.

"The case of the hen is the most interesting I've ever tackled. I've been working on her, most of the time on the theory that it was only a canker, but a few weeks ago I got a hunch that I was wrong, so took a new shoot on the treatment. The sore started out like a canker and each day, even though I picked it off, I found it eating deeper into the throat. It is just at the base of the tongue and only a little distance removed from the opening to the windpipe. It is a hard place to get at, but by using an electric light close up and the orangewood stick I've been able to dig it out each day. It is now a hole about a quarter of an inch deep and as big as a dime.

"I had one pullet that had a canker which *turned into a cancer,* for while it at first was easy to remove, it later began to eat into the tongue. She had lost over one-half of her tongue, or a side of it, when I got the silver nitrate hunch and it stopped the cancer right then and there. But she had been doped so much and so thrown out of condition that she went into a molt, though she had never laid an egg.

CAN BREED LATE MOLTERS

"Interested in some more things I think I've found out for sure. One is that one can breed late molters. I had three very light birds—grand dam, dam and daughter—all same type and color, great on undercolor and the grand dam the lady who won sixth pullet in Chicago. They laid fine up to about December 1st, didn't shed a feather up to that time. One morning I went into the chicken house and found several hatfuls of feathers. Looked around and all three of those birds were as bare as my hand; the saddest looking affairs I ever saw, for it was during that awfully cold spell. I hustled them into the house and began to feed them heavily and now all of them are back in the chicken house, with a pretty fair supply of feathers, and one of them is laying, though she has plenty of feathers still to grow. I learned one other thing—that a molting hen craves green stuff; cannot get enough of it—in fact they wanted nothing but sprouted oats and lettuce, so I figured they wanted the iron more than anything else."

PIP

A mucous or discharge from the mouth sometimes collects and drys on the tip of the tongue. The skin becomes hardened or a scab forms and sometimes cracks partially away from the tongue leaving a raw surface.

The first thing to do is to treat the cause, which is usually the result of colds or catarrh. It is best to keep the scab moistened with a mixture of equal parts of glycerine and water. After the scab comes off the surface should be treated with a disinfecting solution of some sort and then with glycerine. You should not confuse this trouble with the more serious disease known as canker.

TUBERCULOSIS

The most common method of spreading this disease is through the transfer of infected fowls from flock to flock. It is said that it can be transmitted through eggs. The most common source of infection is through the droppings of infected birds. As is explained later, when a post-mortem is made the liver will often appear spotted, being studded with creamy-white or yellowish white tubercles. The spleen is usually enlarged and often

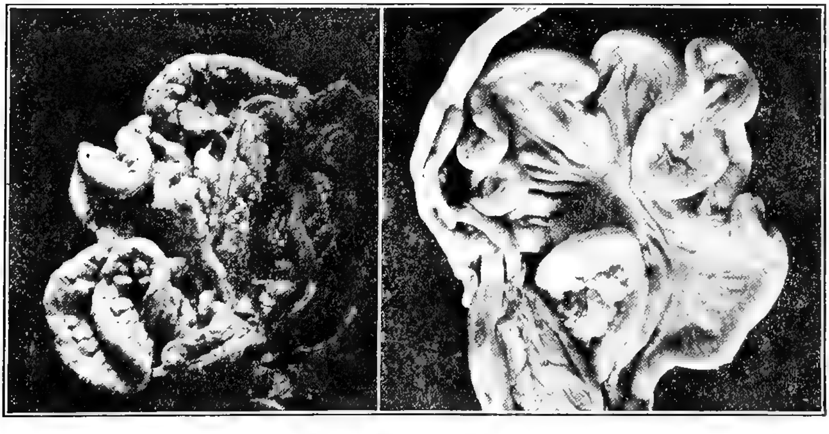

Fig. 32.

On the left is the intestine from a chicken affected with tuberculosis. You can easily see the little white nodules covering the intestine. On the right is the intestine from a healthy fowl.

covered with the tubercular nodules. The intestines are often infected the same way. The lungs and other organs may show signs of infection, but not so often visible to the naked eye as in the case of the above organs. The bones are often affected, especially around the knee joint and birds thus affected generally show signs of lameness.

This disease is becoming more common. We recently visited a large poultry farm in the East in company with three men from a Canadian Experiment Station. We found a number of adult fowls sick, and asked for permission to examine one that was near the point of death. We found the bird was dying as a result of this dreaded disease. The poultry farm was selling baby chicks by the thousands from this stock and shipping them to all parts of the United States and Canada. What may we expect of the future if diseases are scattered promiscuously?

These minute germs gain entrance to the body and there multiply by the thousands, causing small tubercles or nodules to form, as in the accompanying illustration. It is difficult to recognize the disease in its first stages. As time advances the bird grows thinner, the comb and wattles grow pale, and the bird shows general weakness. In the more advanced stages the feathers are ruffled, the bird becomes lame nad often has diarrhea. Because of the lameness, caused by tuberculosis of the joints, many poultrymen call it rheumatism. The birds often have bright eyes and a good appetite. Dr. Morse says: "At the post-mortem examination you may have your suspicions strengthened by finding liver, spleen, intestines and membrane uniting the intestinal folds (mesenterics) studded with yellowish white cheesy nodules of various sizes."

METHODS OF CONTAGION.—(From Poultry Diseases and Their Treatment, Maine Experiment Station). The spread of tuberculosis from fowl to fowl takes place when the living bacteria are transferred from the diseased to the healthy birds. From the fact that tuberculosis lesions are most

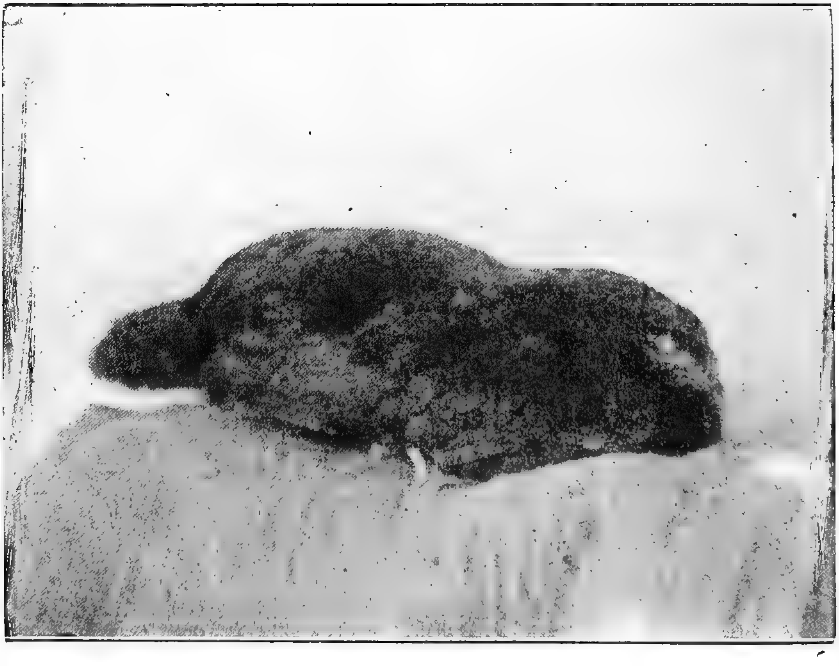

Fig. 33.

A case of tuberculosis in the last stages. The hen was practically nothing but skin, bones and feathers.

commonly found in the internal organs of the digestive system we may conclude that the bacteria usually enter the body along with the food. Examinations of the tubercles situated along the intestine shows that in many cases these communicate directly with the interior of the digestive tract. These are constantly emptying enormous numbers of bacteria, which are carried to the outside by the feces of the bird. Without doubt the droppings of tubercular fowls are the most important factor in the spreading of this disease. This is especially true when in addition the birds are fed on ground which is partly covered with these droppings. Besides, the infectious material may be very easily carried by the feet and thus mixed with the food.

CONTROL:—Tuberculosis can be eliminated only by disposing of the infected stock. Treatment is impractical and of no value in the control of the disease. To eradicate the disease:

1. Replace the entire flock as soon as possible with healthy birds raised on uninfected ground.
2. Kill and burn all birds showing symptoms of tuberculosis.
3. Put dropping boards in poultry houses and keep them clean.
4. Get plenty of fresh air and light into the poultry house.
5. Get rid of old fowls.
6. Burn and bury deep all dead birds.
7. Plow up and sow down land when practical.

TREATMENT.—No cure is known for the disease at present. Remove all sick birds. Disinfect the houses and everything used in connection with the poultry yards. If many birds are affected we advise selling the flock and buying from a flock which is known to be free from tuberculosis.

Extreme care should be taken that the ground around the chicken house and the house itself are absolutely disinfected. Cultivation and a growing crop will aid materially in getting rid of the disease in the ground. As a precaution, bichloride of mercury can be used in the drinking water, in the proporton of one 7.2 grain tablet to each gallon of water. Use cement, earthen or wooden vessels as bichloride of mercury readily attacks metal.

Prof. S. F. Edwards, in the Journal of the American Association of Instructors and Investigators of Poultry Husbandry, has this to say concerning the control of tuberculosis among fowls:

"There is little or no satisfaction in attempting to treat individual cases, and the use of drugs is a waste of time, patience and money. When once the disease gains a foothold in the flock, it is difficult to eradicate except by the adoption of drastic measures. The quickest and most effective method is to kill off all the birds, disinfect the premises as thoroughly as possible, and start with new stock from a flock that is known to be free from disease. In small flocks this method would seem advisable. The fowls could be examined, and all that were found to be free from the disease could be sold, thus lessening the loss. In large flocks or where it is desired to preserve a certain strain in breeding, a modified Bang system may be carried out based on the same principles as employed in eradicating tuberculosis from a herd of cattle. All birds that show the least signs of illness should be promptly slaughtered and cremated. The well birds should be removed to a new ground, and new houses built; or, if the houses already in use are of sanitary construction they may be thoroughly disinfected and whitewashed, after which they may be moved to the new ground and used with safety.

"Eggs for hatching should be secured from stock that is known to be healthy. If incubators are used the problem is simple. Keep the chicks entirely separate from the old fowls and on clean ground only, and as they grow up dispose of the old flock to the best advantage possible, thoroughly disinfecting the houses and runs used by the old flock. If hens are depended on for hatching, the chicks should be taken away to artificial brooders as soon as hatched and raised as already suggested, entirely separate from the old flock. Precautions should also be taken to prevent the possible infection of the fowls from bovine sources by the feeding of offal from slaughtered tubercular cattle or hogs, or from human sources by picking up sputum carelessly expectorated onto the ground by consumptive persons.

"Care should be taken also in buying new stock, to secure birds only from flocks that are known to be free from disease. An additional preventive is to increase and maintain the natural vigor of the fowls by care in breeding and feeding, and housing in open air houses."

CROP BOUND

SYMPTOMS.—The crop is hard and greatly distended. Sometimes a bad smelling liquid runs from mouth and nostrils. The bird's feathers often appear ruffled and the comb is pale.

TREATMENT.—These cases often can be cured without an operation by getting the bird to swallow sweet oil and castor oil. Beginning at the top, work the contents of the crop and knead it until you have loosened a part of the contents. Give more oil and continue to knead until the contents are all loosened. Then hold the bird with head down and try to work some of the mass off through the mouth. If you are unsuccessful in this an operation may be necessary.

The following methods for this operation are given by Sanborn (Farm Poultry Doctor): "If someone can hold the bird for you it will make the operation easier. Pluck out a few feathers and then cut through the skin over the crop a line about one inch long. This cut should be in the middle in line of the body. Then make an incision three-fourths of an inch long through the crop. The distension of the crop will cause the opening to gap, and the mass will be in plain sight. With toothpicks, blunt pointed scissors, tweezers or similar tools, take out the contents of the crop. This done, run the finger into the crop and make sure that there is nothing remaining to obstruct the outlet to the organ. When sure all is right, take three or four stitches in the opening in the crop, making each stitch by itself and tying a knot that will not slip. Then do the same thing to the cut in the skin. For stitches use white silk, or if nothing better can be obtained, cotton thread, No. 60. Keep the bird by itself for a week, feeding soft food.

"The above operation is not a difficult one and is usually successful. Care should be exercised to have the hands and instruments thoroughly clean. After the contents of the crop have been removed the wound and the empty crop itself should be thoroughly washed out with warm water (108 degrees to 110 degrees Fahrenheit). The edges of the skin wound should be well greased with vaseline. It is well to feed the bird only milk for the first day or two."

If you have many cases of crop bound try to discover and remove the cause. If you have dirt floors in your poultry house and these are covered with litter, you may have trouble with crop bound. If you feed sprouted oats or other green feed, or moistened mash and throw these in the litter on the floor, you will have many cases of crop bound. Many hens thus affected in your flock indicate that there is something seriously wrong with your methods.

INFLAMMATION OF THE CROP

Inflammation of the crop is frequently caused by the bird eating something which affects the inner lining of the crop, such as mashes which are too hot, unslaked lime, paint peeling, rat poison or grain husks.

This inflammation causes the bird to have abnormal thirst for water, so that one of its first symptoms is its thirst, the crop being filled with water and gas, together with small quantities of food.

The crop is distended but soft. The bird is indisposed to move and frequently shows a sign of vomit.

If the bird is turned head down the liquid passes out at its mouth. The liquid has an offensive odor which is caused by fermentation. The first step in the treatment of the disease is to empty the crop, which is done by turning the head downward and pressing on and kneading the crop. Give the bird some warm water by pouring it down its throat, then knead the crop and repeat the above operations. This removes the foul contents. Give a teaspoonful of castor oil as a purgative, and one-fourth teaspoonful of common baking soda in a teaspoonful of water to correct the acidity.

Charcoal also has a tendency to correct the acidity and should be kept before the birds at all times. Bismuth tablets, two or three grains, about three times a day may be used to advantage.

WIND PUFFS AND INFLATED CROPS

Occasionally birds, both old and young, will be found with wind puffs which have accumulated beneath the skin, and cause the body of the bird to have a very much enlarged appearance. This is quite common in young cockerels that have been caponized. In such birds we take the point of a sharp penknife and puncture the skin and allow the air or gases to escape. If the birds are properly fed and cared for, in a few days the trouble will disappear. In some cases this trouble can be brought on by improper feeding which results in indigestion and accumulation of gases.

Where the crop is greatly inflated it is sometimes caused by birds eating decayed food or foods that have become soured and impure. This condition is due to the pressure of gas forming bacteria. You should first remove the cause and then give a mild antiseptic in the drinking water, such as 1 to 1,000 bichloride of mercury or 1 to 500 carbolic acid.

THE LIVER AND HEART IN HEALTH AND DISEASE

The liver and heart are the two organs very closely related to health and disease and are linked together by the circulatory system. In order to get their relation, let us trace the circulation of the blood. For the heart there are practically two circulatory systems, one to the lungs, where the blood receives its oxygen and gives off carbon dioxide, the other to the body cells and digestive tract, where the blood carries the oxygen and food supply, takes off carbon dioxide and waste material from the cells, and from the intestines takes up food material and moisture.

Beginning at the left ventricle, the blood is forced into the aorta, or large blood vessel. This branches into smaller blood vessels in various parts of the body, first to the heart itself, then to the lungs, and then divides into branches for the anterior and posterior parts of the body.

The arteries finally divide into very small vessels, called capillaries, and it is while the blood is passing through these capillaries that the oxygen and food material is given off to the cells. The oxygen is used to oxidize the food, to produce heat energy and carbon dioxide is produced. The carbonic acid gas, with other waste materials, passes from the cells back into the blood. It is also in the capillaries that the color of the blood is changed from red to blue. This change of color is due to the blood cells giving up oxygen and taking carbon dioxide.

The blood then passes into capillary veins and these empty into larger veins, and finally the blood from the posterior and lower part of the body empties into the lower or posterior vena cava, except the blood from the abnormal organs or the intestines. The latter enters the portal vein. The latter blood is laden with food material and passes through the channels of the liver. Here the bile is abstracted and the liver takes up a great deal of fat and sugars, in the form of starches, to be stored for future use. After the blood from the portal vein passes through the liver it also passes into the inferior vena cava, then to the right auricle.

The blood from the anterior part of the body and head passes through the superior vena cava and also enters the right auricle, then it passes into the right ventricle. From the right ventricle the blood is forced through the lungs. Here the blood corpuscles exchange carbon dioxide for oxygen through the membranous lining of the air cells of the lungs. Impurities are given off here, from the blood serum, in the form of moisture. The temperature of the blood and the body is also controlled to a great extent through the lungs and air cells. This process acts in a manner similar to the sweat glands in the human skin, where moisture evaporates from the surface of the skin and cools the body.

From the lungs the blood passes back to the left auricle through the pulmonary veins and then to the left ventricle, which completes the circle.

The blood is forced to the various parts of the body and lungs by the contraction of the heart muscles, but is forced back through the veins by contraction of the body muscles and movements of the various organs and by gravity. Any interference with the blood circulation through the lungs or liver or intestines soon affects the heart's action. When the lungs become inflamed, as in pneumonia and bronchitis, the blood cannot pass through the vessels. The right ventricle dilates first, then the right auricle and finally the vena cava. There soon becomes a lack of oxygen in the blood, and the condition is noted by the head and comb and skin turning dark in color. This same condition may result from inflammation of the intestines, or by distention of the body with fluids or gas, resulting from peritonitis or by enlargement of the liver. The tendency is to press on the air sacs and lungs and thus inhibit or check the circulation.

When the blood cannot pass through the lungs and right heart the latter becomes dilated and the veins all become distended. This distention is mostly noted in the liver and then the intestines. It is very often the cause of sudden death of fowls. The auricle or the large vein leading into it may rupture, and the heart may be paralyzed, or, as is often the case in fatty liver, there is a rupture in the latter organ.

By the study of the circulation we learn some of the causes of liver diseases. In a way the liver may be said to be a filter for the blood. As stated before, all the blood from the intestines passes through the liver on its way to the heart and the first process of assimilation of food and excretion takes place here. Starches are taken up by the liver cells and converted into sugar. When the body cells need it for food, it is given back to the blood to be carried to tissue cells again. This process of storing fat and sugars may be excessive, especially when highly concentrated starchy and fatty foods are fed. In other words, the hen may not exercise enough or produce eggs enough to use up the food products, and then fat takes the place of liver cells. We then get what is called a fatty liver. In the heart, fat takes the place of muscle cells and even the pericardial sac may be filled with fatty tissues. This formation weakens the organs, as is seen in fatty liver. It is soft and breaks easily. The enlargement also leads to the stoppage of circulation and then by sudden exercise the heart or liver may rupture.

The contracted liver is the result of the fatty liver. While the fat is being deposited in the liver, a great many of the liver cells are destroyed and gradually the liver is not able to do its work. By change of feed, or lack of feed, and by the fowl taking more exercise or beginning to lay eggs, the fat stored in the body and liver is used up. The liver shrinks into a small organ because the liver cells were destroyed by the fat and are not again formed.

In infectious or in inflammatory disease of all kinds, more especially diseases of the intestinal tract, the liver is usually affected more or less. The liver is a filter, and as disease germs circulate in the blood there is no better place for them to lodge than in the liver. This is the reason we find the red inflamed spots or white particles in the liver when other parts of the body are diseased. We have many poultrymen report that their birds are dying with liver trouble. They examine the dead bird and find the liver discolored and not otherwise normal in appearance and their first conclusion is that death was caused by liver trouble of some sort. We remember one case where dozens of hens had been lost and in each case they reported liver trouble as the cause. We examined some of these dead birds and found death resulted, in each case, because of ovarian trouble. The impurities from the ovary had been taken up by the blood and nature, in trying to correct the trouble, had lodged many of the impurities in the liver. This caused a slightly enlarged liver with many discolorations. You will find this same condition of the liver resulting from many other diseases. In its effort to correct such conditions, the liver is usually more or less thus affected.

In white diarrhea the germs are isolated from the liver in pure cultures, and it may be the place of isolating other disease germs.

Again, the liver is in close contact with many other organs, with only a thin membrane to separate them, as the intestines, lungs, heart and air sacs. When the surface of the liver becomes inflamed or one of the organs becomes diseased, the disease extends through the membranes, and that is the reason we so often find more than one organ affected at the same time. We find cheesy deposits or pus in the air sac when the liver is affected, or the surface of the liver becomes affected when the lungs are inflamed. There are conditions anyone can observe by making careful dissections of the chickens that die in their own flocks.

LIVER DISEASES

SYMPTOMS.—Congestion and inflammation of the liver are usually caused by too heavy feeding of a ration which is too rich in starch elements. Feeding too much corn, blood meal, or so-called egg foods, especially to birds which are housed and yarded in small lots, will irritate both liver and egg organs. The first sign of the trouble is a watery diarrhea, dark at first, but changing in a few days to a yellowish color. The feathers are rough and dull and are inclined to stand out on the birds. At first there may be a lack of color in comb and wattles, but they usually change to a dark red or purple, and sometimes the trouble is caused by overfat. In a word, the birds may die on the nest or be found dead under the roost.

TREATMENT.—Stop feeding all heavy, starchy, fattening foods and feed lightly for several days, supplying the fowls with a good deal of cut clover, alfalfa or green food. As soon as any appearance of the trouble is noticed, give each sick bird a tablespoonful of castor oil. Be sure that your birds get plenty of exercise by providing scratching material. Give your birds a dose of epsom salts in their mash food or drinking water at least once each month. In case of a serious attack, after a good dose of castor oil has been given to the sick birds, follow with one-fourth teaspoonful of tincture of nux vomica to every pint of drinking water.

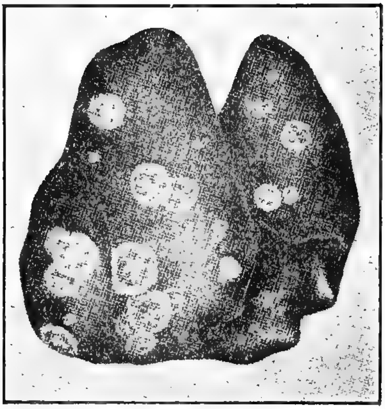

Fig. 34.
Illustration of a diseased liver.

SIMPLE DIARRHEA

The ordinary case of diarrhea is usually caused by one of the following reasons: Lice and mites, uncleanliness, dampness, crowding, lack of shade, foul water, overdoses of pepper and condition powders, too much meat or ground bone, tainted meat, exposure, climatic changes, over-eating or sloppy food.

When cases are first noticed take all feed from the birds for several hours, allowing only pure fresh water. The only treatment necessary in most cases is to discover the cause and remove it. The birds should be fed lightly for a time and a little powdered charcoal mixed in their food. If the birds are valuable and demand individual attention, give each one-third to one teaspoonful of castor oil, or a tablespoonful of olive oil, or one-half teaspoonful of Epsom salts at the beginning. Begin feeding with boiled milk or curd, to which is added a liberal supply of powdered charcoal. If you haven't the milk, well cooked oatmeal or rice will answer. To this add the charcoal. Feed about three times a day and return to the regular ration gradually. Disinfect the houses and runs where such birds have been kept.

ENTERITIS DYSENTERY

SYMPTOMS.—This is a more severe form of diarrhea than the above. This is sometimes accompanied by mucus and bloody discharges. The comb is at first pale and limp and then later becomes dark and purplish. The bird is sleepy and does not care to exercise. The crop may be full of food or may contain only a little slimy fluid. If the bird has been sick for some time, upon examination the liver will be found to be shrunken. The intestines are full of mucous and are enlarged. This may be caused by foul water, or by decaying meat or food. Intestinal parasites may cause the disease.

TREATMENT.—If possible, determine the cause of the trouble and remove the same. Change the sick birds to other quarters. Clean and disinfect. Do not feed too heavily. Reduce the amount of bran and add more middlings and mix a good supply of powdered charcoal in the dry mash. For each bird dissolve one tablespoonful of Epsom salts in water and mix the mash with this. Potassium permanganate should be used in the drinking water. Treat much the same as is recommended for simple diarrhea.

A PREVENTION FOR DIARRHEA IN CHICKS

When removing chicks from incubators use the utmost care that they do not get chilled. As each chick is placed in the brooder, dip its beak into warm, carbolated water. See that it has at least one good swallow of water, containing five (5) drops of refined carbolic acid to each one pint of drinking water. Water of this strength should be left before them with drinking water to which has been added three (3) drops of refined carbolic acid to each pint of water.

It is better to use a regular medicine dropper when placing the carbolic acid in the water. An abundance of fresh air must be permitted in the brooder room and about the actual hover; care must be taken that the chicks are not chilled and just as much care that they are not overheated. Get them on the ground as soon as possible, but always have it so that they can get back to their hover, which should be kept around 95 to 100 degrees the first ten days or two weeks. In the very beginning cull out any which show a tendency toward a bad case of bowel trouble. However, unless the stock is badly infected very little trouble should be experienced if the above treatment is used.

If the chicks are properly bred, incubated, brooded and fed, not much trouble will be experienced with any kind of diarrhea.

INFORMATION CONCERNING DIARRHEA

"White diarrhea itself may be brought about by any of a number of causes—improper incubation, faulty methods of handling and caring for the chicks after hatching, etc.; but the worst form of the mischievous disease is that caused by the bacteria B. Pullorum. With the fact that loss of, say, one-half or two-thirds of a season's hatch attributable to the ravages of this disease, let us ascertain the cause. It is found in the presence of these germs in the old hen or breeding stock—always in fairly large numbers within the body of the infected hen in the undeveloped egg or ova.

"Tracing the life cycle or growth of these germs for a few years, starting with the hen that is being utilized for breeding purposes and with one that we know to be suffering with the disease (infected), by the trapnest method we ascertain that the hen is not a good layer, the disease preventing the fowl laying many eggs.

"By analyzing the eggs of an infected hen, we find in some of them germs of white diarrhea (B. Pullorum). Other than by bacterial examination, there is no way to ascertain which of the eggs contain the germs, and which of them do not; the germ eggs and the good eggs look exactly alike, and have the same outward appearance.

"We set the eggs of the diseased or infected hen. It is only natural that some of the eggs contain the bacteria, hidden in the yolk. The eggs hatch and the chicks appear normal in all respects. The chicks, however, hatching from the germ eggs, still retain the bacteria in their bodies, in the yolk from which they pass into the blood and some are given off in the excreta. In a short time the appearance of the chicks becomes abnormal. They apparently suffer from chills, for they huddle under the brooder next to the heating system. Their heads are drawn in, and around the vent the excreta collects, forming a hard mass, generally spoken of as "pasted up" behind. These masses of excreta containing the bacilli germs are objects to which the healthy chicks pay strict attention, losing no time in picking at them and thereby becoming infected. In this manner the germs are contracted and passed from one little chick to the other.

"It is evident, then, that even one of these debilitated chicks may cause considerable loss. When there are several, as there are likely to be, the loss of the erstwhile healthy chicks naturally is heavier. It must be remembered that not all the chicks which have the germs through the accident of birth, or that pick them up as described, die. About 25 per cent do not die, and for that reason the germs continue to live their lives of mischief. While cases are on record in which all the chicks in a hatch have been lost, and that seldom is the loss less than 30 per cent, those that do not die carry the germs in their bodies, lodged in the ova undeveloped eggs; and to these birds the term "bacillus carriers" may be applied. When grown these chicks lay eggs, some of which are germ laden and hence the disease is transmitted from one generation to the next.

"The source of trouble and loss, so far as white diarrhea, the bacillary form, is concerned, having been traced to the infected hen that lays the infected egg, the best method of procedure is to kill the hen and dress it for market—a simple means of eradication, to which no objection can be made, seeing that fowls so infected are fully as good for the table as the non-infected, as the disease is one that confines its ravages to poultry alone. To man it is harmless.

"It would be neither wise nor just to the poultry industry to go into the chicken yard with an axe and slay indiscriminately; in so doing, the good layers would be killed with the bad, causing loss of time and profit. A weeding out process must be adopted—a process by no means simple and not understood by the average poultryman. The differentiation of the bad from the good is done by testing the blood of the fowl. Small quantities of blood are taken from the wing veins of individual birds and this blood is submitted to tests. On account of the nature of the work, this must be done in the laboratory. The process is known as the Agglutination test, Blood from the individual fowl having been tested by this method and found to be positive, the supposition is that the bird from which the blood has been taken is a bacillus carrier—the germs are within its body—and the bird should be eliminated from the flock. The killing of just one of these bacillus carriers spells true economy, when the sober fact is remembered that from the infected eggs the hen might lay, losses multiply.

"For white diarrhea, bacillary form, in young chicks, there seems to be no absolute cure so far as is known. Several remedies have been recommended, but cases of guaranteed cures have not been reported. Care should be taken to isolate the sickly looking chickens from the healthier ones upon hatching, thus eliminating the possibility of infection. It is of great importance, too, that while the chicks are in the incubator they do not pick the excreta of one another. This may be prevented by covering the incubator with dark cloth or other material until such time as the chicks are ready to be removed to the brooder. The use of sour milk for the feeding of chicks has been found to be very beneficial. When infection has once set in and the losses amount to large numbers, it is practically useless to try to raise chicks unless all the brooders, incubators and all other things pertaining to the welfare of young chicks are thoroughly cleansed before using. This is done by boiling out with soap suds or by the application of a good disinfectant. Chloride of lime dissolved in water and then sprayed over the material to be used, brooders, etc., is very effective in this respect.

GOOD PREVENTIVE FOR WHITE DIARRHEA

In many instances the following remedy has been helpful in preventing white diarrhea:

Zinc Sulphocarbolate	15 grains
Calcium Sulphocarbolate	7½ grains
Citric Acid	3 grains
Sodium Sulphocarbolate	7½ grains
Bichloride of Mercury	7 grains

This quantity should be placed in 1 gallon of drinking water and kept before the chicks constantly until they are about three weeks of age. They should have access to no other water. This prescription can be filled at any drug store in powder form. Better have several of the powders prepared at a time so that you will have enough to give the remedy a thorough trial. This is one of the best preventives for bowel trouble and diarrhea that we have ever used.

"In conclusion, we assert that white diarrhea, bacillary form, may be eliminated from the flock, although there seems to be no cure. If many of the young chicks die and there are evidences of pasting up of the abdomen, general weakness and stunted appearance, the chances are that some of the chicks have suffered from the bacillary form of white diarrhea.

"If it is possible for you to do so, obtain your eggs for hatching purposes from someone whom you know has stock that is free from white diarrhea. If you hatch out eggs from white diarrhea hens, then you cannot expect to raise the little chicks. This terrible disease is transmitted directly from parent to offspring. Either have your hens tested or set healthy eggs, and in this way only will you have success."

WHITE DIARRHEA

The subject, "White Diarrhea in Little Chicks," has been fully discussed in the lesson on 'Baby Chicks." Students who wish to study this subject are requested to refer to the above lesson.

TURKEYS SPREAD GAPES

Bulletin No. 939, recently issued by the United States Department of Agriculture, shows that adult turkeys are important carriers of gape worms and indicate that allowing turkeys and chickens to range together is often responsible for serious outbreaks of gapes among the baby chicks. In examining a large number of adult turkeys on the Washington market it was found that 22 per cent of these birds were infected with gape worms, while practically no worms were found in adult chickens. The bulletin reports that investigations on a number of Maryland farms show that gapes always are worse among chicks, where turkeys and chickens are kept together. It has been pretty definitely established that chickens harbor the blackhead germ which takes such heavy toll among growing turkeys, and if the turkey in turn harbors the gape worm, which is so harmful to growing chicks, the arguments are certainly strongly in favor of keeping the turkeys and chickens on different plots of ground. Unless the range can be divided so that the turkeys and chickens will not come in close contact, it probably is advisable to decide to specialize on one or the other instead of trying to raise both.

THE CONTROL OF COCCIDIOSIS IN YOUNG CHICKS

We feel that the most severe losses that poultrymen have experienced during the past few years in chicks from four weeks to ten weeks of age, has been caused by a disease known as Coccidiosis.

This disease has been quite prevalent in a good many states and considerable work has been done in the state of Pennsylvania along practical lines for the control of the disease. Prof. T. B. Charles of the Pennsylvania State College, has this to say concerning his experience with the disease, and we quote him for the reason we feel that it will be of benefit to our students in controlling outbreaks of this disease among their chicks. We would recommend that you read carefully what he has to say and if any of our students should want us to examine birds which they feel are infected with the disease, we would be glad to make a post-mortem of all such specimens and report our findings. Prof. Charles says:

"*Transmission of the Disease.*—It affects chicks most commonly from the age of four to ten weeks, but may affect chicks much younger. The coccidium when present in the digestive tract of the chick, develops rapidly in the cells of the intestinal mucosa; this gives rise to a large number of both sexual and asexual forms which are voided in the droppings, which then become the means of general infection of the flock.

"*Effect on Chicks.*—The chicks affected show signs of an interruption of the normal functioning of their digestive tract. They show the following general symptoms: Disordered feathers, droopy wings, bunched appearance, general weakness. The droppings become semi-fluid and usually whitish in color, or fluid with a brownish tinge. *In Acute Cases the Droppings Become Bloody.*

"*Examination of the Digestive Organs.*—The lesions are confined principally to the intestinal tract. The caeca are usually distended, and are filled with a bloody semi-fluid mass. This, however, does not always hold true; the material may also be hard or cheesy. Upon microscopical examination may be seen blood cells, cells of the mucosa, fecal matter, and numerous coccidial forms, especially the oocysts or resistant stage.

"My personal experience in controlling this disease: In 1917 the first occurrence was on a farm where poultry had not been kept for ten years. Affected chicks eight weeks old were shipped to Dr. Pickens at Ithaca, N. Y., who diagnosed it as coccidiosis and said that the germ would live in the soil for four or five years. He stated that isolation of the affected chicks and sanitation were the only possible means of control, and that in general, treatment was unsatisfactory and unsuccessful:

"Following out this program I disinfected the houses daily, limed the yards, isolated the worst infected chicks, 'and on a hunch of my own' cut out all grain from the ration and fed only a moist, crumbly mash to which I added a medicinal poultry food. This secured fair results, but the mortality in one flock of chicks reached 50 per cent.

"The same season and shortly after another flock became infected and under similar treatment the mortality reached 25 per cent. The following year the disease again occurred in a flock of 300 chicks and the mortality was 10 per cent. The next season there was not a recurrence of the disease, probably due to thorough sanitation.

"*Treatment of the Disease.*—We recommend the following treatment: If possible move the houses to new ground immediately. If this is not practicable, thoroughly lime the ground and also the brooder house. *Lime* is most effective and efficient for thorough sanitation; its abundant use both in the yards and in the brooder house will limit infection of chicks. It will be necessary to clean the house thoroughly. This may be done by using a good coal-tar product such as Zenoleum or Carbolineum or a ten per cent solution of crude carbolic acid. The litter should be changed daily and I believe it is advisable to burn all litter. The coccidium which causes this disease lives in the ground for several years (according to Dr. Pickens formerly of Cornell) and the control of the disease is one of absolute sanitation. It involves an enormous amount of work, but if handled carefully and thoroughly most of the chicks can be saved.

"*Treatment of Chicks.*—Remove at once all scratch grain from the chicks and give them a moist crumbly mash including Epsom salts at the rate of one-quarter pound to every one hundred chicks. *The epsom salts are to be used simply for one feeding*, but this treatment may be repeated weekly until the chicks are thoroughly out of danger. A good wet mash for chicks of that age may be made up as follows: 2 lbs. wheat bran; 1 lb. wheat middlings; 1 lb. corn meal; ½ lb. beef scrap. If milk is available, the beef scrap may be omitted from this mash and the mash itself mixed up with sour milk so that it is in a crumbly condition when fed to the chicks. Feed the chicks three times a day about what they will clean up in ten to fifteen minutes each feeding. Both water and sour milk or buttermilk should be available at all times.

"Thoroughly disinfect and clean all mash hoppers, drinking fountains and other appliances at least once daily as the droppings of the affected chicks contain thousands of coccidia and the feed troughs become very easily contaminated. It pays to use a disinfectant in the drinking water. I have used refined carbolic acid—about 1:100 solution. Hydrochloric acid is probably more effective.

"Separate and isolate all chicks that are seriously affected with the disease and treat them separately. Burn all dead chicks. After ten days to two weeks, when the chicks have 'gotten back on their feet,' it will be possible to gradually work them back to the regular grain and mash mixtures which you have been feeding. Our experience has been that chicks affected with coccidiosis seem unable to digest grain.

CONCLUSIONS

"1. Careful and thorough sanitation of the poultry houses and yards is one of the most effective ways of preventing trouble from coccidiosis.

"2. In the writer's experience, sour milk or buttermilk fed in unlimited quantities will not prevent occurrence of the disease.

"3. Affected chicks are not able to digest grain but are able to digest a moist crumbly mash, preferably one wet with sour milk or buttermilk.

"4. Affected chicks (isolated for the purpose) have in every case been killed by keeping them on a grain diet.

"5. The feeding of unlimited quantities of dry mash to young chicks is favorable for the development of trouble with coccidiosis.

"The treatment outlined above has worked effectively throughout this state (Pennsylvania). The following extracts from letters demonstrate how it has worked under practical farm conditions."

Buttermilk has proven to be very effective in the control of the disease. Give all the buttermilk you can get the chicks to drink.

Another very successful treatment as is quoted by a noted authority who says to put three grains of copperas (sulphate of iron) to a quart of drinking water, or use 15 grains of catechu to a gallon of the water given the birds to drink. In connection with this a good purgative should be given.

We have always strongly urged the use of a moist mash for chicks, fed at least once a day in addition to the dry mash, grain and green feed. The above is but another evidence that we are right in this recommendation. It helps prevent many chick troubles.

CHOLERA

SYMPTOMS.—There is no desire for food, but the bird is decidedly thirsty and sluggish. The first discharge from the bowels is usually thick, but as the bowels become empty the discharge gets less solid and quite watery and yellowish. As the inflammation of the bowel lining increases there appears slight, bloody streaks in the discharge, and this may increase until the droppings are nearly pure blood.

Severe cases show some irritation of the throat and nostrils, a slight discharge appearing in the mouth and eyes. At the end of the first day you may expect to find the bird decidedly weak. The comb gets darker than in health, passing from red to purple as the disease progresses.

CONTROL.—Treatment of sick birds is not practical. On finding sick or dead birds proceed immediately as follows:

1. Place dead birds temporarily out of reach of other birds.
2. Make sure the trouble is fowl cholera and then kill all sick birds by dislocating their necks.
3. Burn with oil or bury at least three feet deep all dead bodies and all yellow and green excreta that can be gathered.
4. Place one 7.3 grain mercury bichloride tablet in a gallon of drinking water in a non-metal container or use one 30-grain sodium sulphocarbolate tablet per gallon water. These tablets are used only when the disease is present and then never more than 10 days at a time.

TREATMENT.—Very often poultrymen are inclined to term bad cases of diarrhea as cholera. Genuine cases of chicken cholera are rare. But when fowls are infected with this disease treatment should not be attempted. Kill and burn the bodies of all infected birds. Clean out the building in which they are housed and thoroughly disinfect; the runs should be disinfected with quicklime.

OVARIAN AND OVIDUCT DISEASES AND PERITONITIS

This is a very complicated subject and will require a great deal of study in order to differentiate the primary cause of the disease when several parts of these organs are affected at the same time. During the last year a thorough study of the above diseases and their complications was made, and by very close observation ovarian diseases and oviduct diseases could not, in many cases, be differentiated; that is, which of them was the primary cause. These organs are very highly organized and very sensitive to disease, and when we think of the hen passing through the act of labor at least once in twenty-four to forty-eight hours, we should not wonder that there are so many deaths due to diseases of these parts. As a general rule, these diseases are not recognized by the poultryman while the hen is alive. When she is dead, a post-mortem is not made. It is called going light or general breakdown or something else. If a post-mortem were made on all hens that died in the State of Missouri, poultrymen would be amazed that the number of deaths due to ovarian disease would reach nearly one-half of all other diseases put together, in mature fowls. Placing ovarian and oviduct infection with peritonistic in one class, it will be necessary to trace the source of infection. First, is infection along the oviduct, and enterng at the cloaca end? Second, is infection or inflammation extending from the intestines or directly through their walls? Third, is it through the circulation? Fourth, is this ovarian trouble and the breaking down of the ovary caused by the white diarrhea germs? The hens which have this ovarian trouble are usually good layers. After death, we have found the white diarrhea germs in the ovaries of some of these hens. The ovary has the appearance of a white diarrhea ovary. It may be that these germs and the strain of laying break down the ovary, inflammation sets in, and peritonitis and death result. This has yet to be proven to be the fact, but this is a reasonable conclusion.

The frequent laying of eggs cannot help irritating the mucous membrane of the tract; and the contraction of the muscles while propelling or attempting to expell the egg will often rupture small blood vessels. Their being more or less bacteria present, the infection or inflammation starts at these places. The local inflammation or infection produces fever and both decrease the normal secretion of the oviduct. Even when the above occurs the funnel end of the oviduct takes up mature ovules and attempts to pass them. The membranes being dry and inflamed, the muscular contraction ruptures the yolk in some cases. At other times, yolks or eggs are broken by attendants handling the hen or they may break when hens fly on or off their perches. There may be an obstruction to the oviduct by foecal matter packed in the rectum or there may be a growth in some part of the oviduct. When the egg ruptures, parts of it pass both ways, back into the body cavity and out the normal way. With this material, bacteria are also carried and peritonitis and intestinal inflammation are the result. A large amount of egg material may remain in the oviduct, as is found a great many times. It is coagulated and may entirely fill the distal end of the oviduct. In other cases eggs are shelled and pass back into the body cavity. If this is the case, then bacteria can also pass the same way, as well as the spermatozoon.

It is also found that when hens are suffering from other diseases, the ovaries are inflamed and some fully formed or partly formed ovules are partly re-absorbed and still left in the follicle. These yolks in many cases are also found partly cooked in the body cavity. This is caused by the fluid part of the egg material being re-absorbed by the tissues, leaving the solids. The infecting material in the follicles gets there through the blood stream or by direct contact. The ovarian follicles are very vesicular and when they rupture there is a degeneration or re-absorption of these vessels and tissues. These blood vessels and blood go through the process of thrombosis to a certain extent; and this may be the starting point of trouble.

Normal egg material may be absorbed about as fast as the ova can mature. During the last year several hens in this condition were killed in our laboratory. They went on the nests, but did not lay. When opened, normal and fully developed ova were found in the body cavity, others were ruptured, while others were still in the follicles and about to rupture. In these cases it was found that the oviduct was either closed by sear formation or contraction or closed by some tumor. These prevented the exit of the eggs, or external material from getting back into the body cavity. In these and in infected cases, an interesting fact was discovered. By the aid of the microscope particles of egg yolk could be seen in the white blood cells. It shows that if blood cells can take into themselves particles of egg yolk they can also do the same with bacteria and carry them back into the system. It was also found that in the latter case, when the hens were apparently well, there was none of the coagulated egg yolk, as in cases where hens had fever.

There are specific germs or a germ that the hen is susceptible to, or rather, is not exempt from. By chance, if these germs are present when one of the foregoing pathological conditions occur this germ begins its work. We have taken some of the infected material from several hens that were suffering from an infection of the ovaries and oviduct. It was injected into twelve other hens, pullets and cockerels and in different parts of the bodies. All became ill. Seven of them died and five slowly recovered. In all cases there was a local pus formation, with inflammation, languor, stupor, loss of appetite, and great thirst and fever. They would usually favor the afflicted side or limb or lie on that side. Some would act as if broken down in the back, as is mentioned by some books; others would sit down or act as if bearing down. They would stretch their heads out and throw them to the side, as if suffering pain. There was also diarrhea, very often of a yellowish color. In hens that died and were laying before or at the time the material was injected we found the ovaries, oviduct and peritoneal cavity in the same condition as in the hen from which the material was taken, namely, coagulated egg yolks, some of the follicle ruptured, and the yolk partly absorbed in some follicles, and of a darkened or greenish color.

Some of the material was taken to the laboratory and germs were isolated. These germs were reinjected, and in two instances the same disease or result was produced, while some of the other germs were injected under the skin in quite a number of birds with no effect. Thus far we have no specific remedy. The hens should be placed in a dry, warm room, well ventilated and kept very quiet. Where there is very frequent bowel action and pain, ten drops of the tincture of camphorated opium may be given, several times a day. Allow some pure water or add some zinc sulpho carbolated to the water. It prevents fermentation in the fowl. After a day or two give a dose of salts or oil. Then begin to feed lightly on mash or sour milk. In case of the egg material coagulating in the oviduct or shelled egg passing back into the body cavity, poultry surgery will have to be resorted to. The same may be done in the case of ruptured oviduct.

Gangrene may result in the inflamed oviduct or in a twisted oviduct. It may also result from the impacted egg in the uterus. There is no remedy for this condition unless the case is diagnosed early. This, however, is not the case generally, except in the prolapsed oviduct. In the latter, sponge the parts well with carbolized vaseline or olive oil, then by gentle pressure force the mass back while holding the hen with head down. If there is an egg in the oviduct inject olive oil, then pass the finger into the oviduct to guide the egg and with thumb and forefinger of the left hand make pressure on each side of the body and back upward toward the cloaca. If you cannot remove it in this way, break the egg and at least remove all the shell. In case of egg bound, without prolapse, inject olive oil into vaginal part of the oviduct, then allow hen to attempt to expel the egg herself. Either method results in congestion of the parts and endangers the hen.

PERITONITIS

The Peritoneum is the thin membrane which lines the abdominal cavity of the bird and covers the internal organs. In cases of inflammation of the intestines or egg organs, liver and kidneys, the inflammation usually extends to the walls of the body cavity, or if the peritoneum is injured or bruised, or some foreign body drops off into the body cavity, such as egg yolk or egg shell, this will cause inflammation and peritonitis will frequently result.

If the walls of the intestines are punctured by worms, or disease eats through, this allows the fecal matter to pass into the body cavity and a severe inflammation will result. If the yolk fails to be taken into the oviduct, it passes into the body cavity and peritonitis will often result. In some cases the yolks or eggs are re-absorbed by the peritoneum, but practically three-fourths of the fowls that are affected with peritonitis die as a result thereof.

The sick birds have a high fever and the abdomen appears hot, swollen and tender. The bird appears to be in severe pain and shows evidence of considerable thirst. The fowl gradually becomes weaker and it is unable to stand and the head is often outstretched in front of the body with the eyes closed, and the bird breathes rapidly and heavily.

When the bird dies and a post-mortem examination is made, the peritoneum and intestines will appear to be cemented together and covered with a whitish or yellowish material. This yellow, cheesy matter is really pus.

These diseases as a rule are brought on by the over-feeding of foods too rich in animal protein or egg forcing elements, such as high percentages of meat meal, beef scrap, fish scrap, gluten feed, etc. As a rule, it is more prevalent in the younger pullets that have just come into the laying period, more so than the older hens. In most cases it is caused by diseased egg organs, organs infected with white diarrhea germs. The organs become weakened by concentrated forced feeding and this disease follows. It is brought on by feeding young birds too heavily on egg forcing foods before they are fully matured, which will cause a weakened condition of the fowl and the breaking down of the egg organs.

As a rule, the first symptoms of this disease are slightly ruffled feathers, very high fever, quick and hard breathing, rather whitish watery discharge, and in most cases a form of leg weakness, paralysis or helplessness.

Peritonitis of the blood is due to a breaking down of the ovaries or egg organs of the female, causing a seepage into the blood which poisons the system. The function of the liver is to take up this poison and pass it out of the system which possibly will show in a form of diarrhea. The liver in time becomes so contaminated that it results in death of the fowl.

The only treatment for this disease is to change your methods of feeding. Eliminate the egg forcing foods. Feed liberally on whole grains, giving a liberal supply of tender, succulent green foods at all times. Encourage exercise as much as possible and give your birds a rest which has long been needed.

Give the entire flock a dose of Epsom salts in the moist mash. The equivalent of ½ teaspoonful per bird. Mix salts with just enough water to sufficiently moisten mash that they will clean up in from 20 to 30 minutes. Starve the birds one or more feeds before giving this treatment. Give one treatment each week until three or four treatments have been given, then decrease to one treatment each month thereafter.

In addition to this, give ½ teaspoonful of nux vomica to each quart of drinking water. Give no other water for ten days, to two weeks in treating this disease.

ZURN recommends wrapping parts of the bird in wet cloths and to give tincture of aconite internally, two drops with a teaspoonful of water two or three times a day.

SANBORN recommends one grain opium pills twice a day to relieve pain and warm liquid foods, such as meat juice and milk in equal parts.

BREAKING OF AN EGG IN THE OVIDUCT

This may happen after the shell has been formed or partially formed, or even before the egg reaches that state of development. These ovarian troubles usually occur during the heavy laying season and are quite frequent among young pullets. They usually result in an inflamed condition of the oviduct, and if the bird does recover, you will sometimes find what appears to be a cooked yolk, surrounded by several layers of what appears to be cooked albumen and other matter. This collection of material is usually several times the size of a normal egg. They are commonly found in the oviduct and sometimes are discovered in the body cavity. We have seen other cases where everything seemed to be in a normal condition, except the broken egg in the oviduct and the dead bird. We have seen many other cases where peritonitis had set in, blood poison had resulted, and the walls of the body cavity were inflamed and the intestines apparently cemented together with whitish or yellowish material that resembled broken yolk and cankerous material. There is no remedy for this trouble, as it is not noticeable until the fowl is dead or near death's door.

RUPTURE OF THE OVIDUCT

If the oviduct ruptures in the albumen portion it will usually heal of its own accord. If the lower portion of the oviduct is obstructed for any reason, or if any portion of it is severely inflamed, it may rupture and allow the contents to pass into the body cavity. In many cases peritonitis sets in and death usually results. The trouble is not noticeable until the bird has almost reached the point of death, and such cases are pronounced incurable If the rupture is only small, it sometimes heals and the bird recovers of its own accord.

OVARIAN TUMORS

The egg organs of a hen are usually taxed to the limit, especially if the bird is a good producer. A good many tumors and cancerous growths are commonly found attached to the oviduct of a hen. None of these conditions can be successfully treated by a poultryman. In the first place it is a difficult matter to determine whether a hen has a tumor or not, until after her death. Even if you knew just what was wrong with the hen, an operation would be necessary, such as cannot be performed except by an expert.

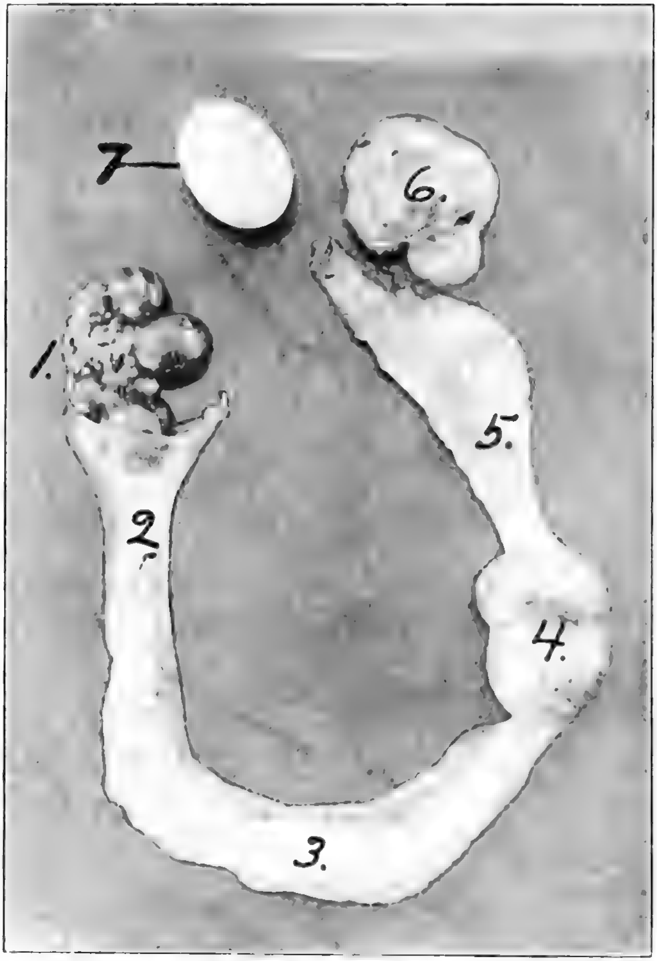

Fig. 35.

Showing the ovary and oviduct of a hen. There was a large tumor near the end of the oviduct which prevented the hen from laying. You can see two hard shelled eggs at No. 4. The tumor is No. 6.

EVERSION OF THE OVIDUCT

SYMPTOMS.—The oviduct protrudes from the vent and appears swollen and inflamed. It is caused by the muscles and ligaments of the oviduct becoming weakened. It may be due to the hen laying very large eggs, a pullet laying a large egg for her size, straining on the nest, or to constipation.

TREATMENT.—Wash the protruding parts with a pint of warm water, to which has been added a teaspoonful of zenoleum, creolin, or a similar disinfectant. Then grease with carbolated vaseline and replace the oviduct. Keep the bird in a dark, comfortable place. It is often necessary to tie the bird up by the legs and let her head and breast rest on the bottom of the coop. Keep her in this position for about twelve hours. Be sure to give the flock a dose of Epsom salts, ½ teaspoonful to each fowl every week if you have much trouble with eversion of the oviduct.

PREVENTING SOFT SHELLED EGGS

The following was recommended to us by A. T. Burnham of Massachusetts:

1. Use very fine ground agricultural lime in mash—put in say 1, 2 or 3 pints in 3 gallons (measure) mash (damp mash).
2. Put in drinking water a gill or two of vinegar to 3 gallons of water.

We have used the following with good results: Use lime water as a drink. Any local druggist or physician can tell you how to make lime water. Allow no other water to drink. Add five pounds of fine bone meal to each 100 pounds of mash fed. Give more tender, succulent green feed. Reduce amount of forcing feed for a short time and feed more grain temporarily. If the thinness of shell is caused by a diseased egg organ or oviduct, there is nothing you can do to remedy the trouble outside of the things mentioned above. We would not breed from birds that had a tendency to lay soft shelled eggs.

EGG BOUND

SYMPTOMS.—Fowls so afflicted will often make frequent visits to the nests. The hen may walk about the yard and stop to strain as if making an effort to lay. They often walk with the abdomen close to the ground and their breast elevated and stand in a sort of upright position. They act as if in distress. The egg can often be detected near the vent by pressure with the fingers.

TREATMENT.—When hens are egg bound use a soft rubber tipped syringe and inject a tablespoonful of olive oil into the vaginal part of the oviduct. Be sure you get the oil into the oviduct. Then allow her to try to expel the egg. If there is a prolapse of the cloaca and oviduct, apply olive oil to the prolapsed part, then hold the hen with head down, and by gentle pressure force the prolapsed part back. Then place the index finger of the hand in the oviduct, and if there is an egg there guide it with the finger. With the thumb and finger make pressure on the abdomen toward the vent. If the egg cannot be removed in this way, break the shell, and when doing so, hold the hen with claca down, and also try to remove the shell, at least. Keep the hen in a dry, warm and quiet place. Let her have water and but little food for a few days.

FREAK EGGS AND THEORY WITH REGARD TO THEM

Fig. 14 shows a healthy ovary (No. 1) of a hen. A tumor (No. 6) caused an obstruction to the outlet of the oviduct and prevented the eggs (shown at 4 and 5) in the oviduct from passing out.

No. 1—Shows the ovary, the grape-like cluster in the back of the hen containing the ovules which develop into egg yolks.

No. 2—Is the funnel region of the oviduct where the yolk is received from the ovary. The mouth of the funnel is in the act of taking hold of an ovule or yolk. The chalazae is a thin layer of albumen similarly situated and twisted at each end, making a white cord-like mass on each side of the yolk extending into the white or albumen. These act like hammock cords and prevent the yolk from rising too rapidly through the albumen. Fertilization is supposed to take place in this portion of the oviduct.

No. 3—Is the albumen secreting section of the oviduct where the rest of the albumen is placed around the yolk.

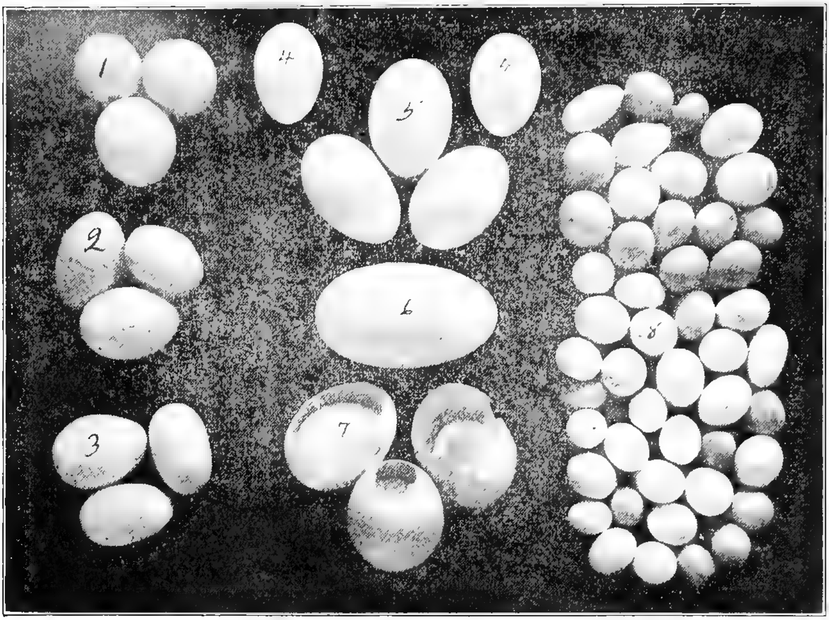

Fig. 36.
Freak Eggs.

No. 4—Is the isthmus; so called because it is smaller than either 3 or 5. There are two eggs at 4, which give it an enlarged appearance. In the isthmus the shell membranes are formed.

No. 5—Is the uterus, or shell forming section.

No. 6—As shown in the picture, is a tumor which prevented the eggs from passing out. The tumor is an obstruction, but the hen continued to produce eggs even though they remained in the oviduct.

No. 7—It is a hard shelled egg which passes the obstruction. Also, an egg partly shelled was at 5, and two soft shelled eggs at 4.

Tumors of this kind are not very common, and do not concern the average poultryman, as they are not contagious. Their removal by a surgical operation is the best remedy, if this is possible.

It will be seen from a study of the above figure that each part of an egg is developed in a separate part of the oviduct specialized for that particular work; that No. 4 is the section where the shell membrane or soft shell is formed.

Laying soft shelled eggs is thought to be caused by a lack of shell-forming material or by fright or by an irritation of the oviduct, but some are laid because of the hen's producing two eggs the same day, which possibly is accounted for as follows: Referring again to this illustration, it is thought to require about three hours in No. 2 and No. 3 (forming albumen), three No. 5 (forming shell).

It will be seen that No. 5 (shell-forming section) is the shortest section in the oviduct and requires two to three times as long to do its work.

When a hen is in good laying condition she can frequently produce two eggs in one day, but only a few hens are able to manufacture the shells for two eggs in so short a time; so, the first egg by means of the contraction hours in No. 4 (forming shell membrane) and twelve to sixteen hours in of the oviduct is forced out, usually at night, and is found on the droppings board next morning. The second egg remains in the uterus and is shelled and laid next day.

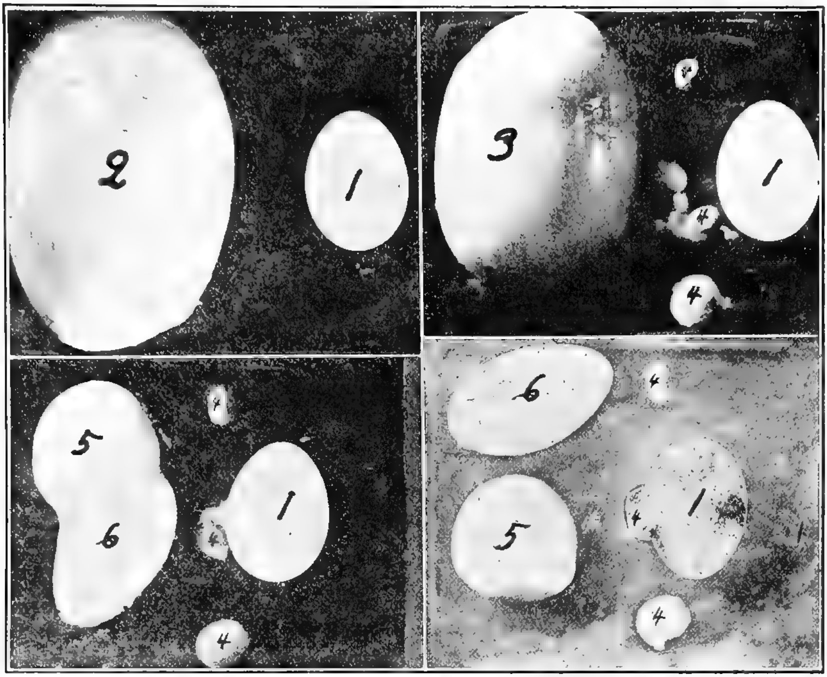

Fig. 37.

Abnormal and Freak Eggs.—No. 1 is an egg of normal size. A normal egg weighs about two ounces. No. 2 is an egg that weighed over 20 ounces, ten times as large as the ordinary egg. It has eleven separate and distinct shells. In the middle of the egg we found the eggs Nos. 5 and 6. The eggs could not be laid because of an obstruction and they were covered and recovered until they became so large that the oviduct was ruptured and the hen died.

Small eggs are sometimes caused by the yolk rupturing and a portion of the yolk material passing into the oviduct. This stimulates the oviduct and results in the formation of a small egg. A small portion of the chalazae, a blood clot or any foreign material passing through the oviduct will cause the hen to cover this with a tiny bit of albumen and a small shell. It is not true that the first egg and the last egg of the clutch are always small.

The irregular shaped eggs which we often find and the frequent laying of soft shell eggs is caused by an unnatural or unhealthy condition of the oviduct.

The small blood clots, which are often seen on the side of the yolk, are caused by the follicle or yolk membrane rupturing at a point where there is a tiny blood vessel. There is a thin streak in the follicle, which surrounds the yolk and holds it to the ovary, where there are no blood vessels. That is where nature intended that the follicle should rupture when the yolk is ripe, but very often the follicle will rupture to one side of this point and that often causes a tiny clot of blood to pass off with the yolk. This is really not objectionable as far as eating the egg is concerned. We often find this condition where hens are forced too much for egg production.

Very few soft shelled eggs are laid because of lack of egg shell material, as the hen will not develop the egg, as a rule, if she can't place a shell about it.

GOING LIGHT

SYMPTOMS.—Going Light gets its name from the rapid loss of flesh. At first you can't notice any symptoms of the disease. You don't realize the birds have it until you find they are very thin. Pick one up and you will find the bird very light and thin in the breast. As the disease progresses the affected birds do not follow the flock. They scarcely move about, appear sleepy, and if forced to move they stagger and fall.

TREATMENT.—You can do much to prevent this trouble by having clean and well ventilated houses and by avoiding the use of bad, moldy grain or litter. Disinfect thoroughly. "Going Light" is not so much a disease of itself as it is a symptom of some other disease.

"GOING LIGHT" OFTEN CAUSED BY INTESTINAL WORMS

Measure out just enough mash, all that the fowls will thoroughly clean up at one time. Moisten the mash with water and add to the mash one teaspoonful of Oil of American Wormseed (Jerusalem Oak) and one teaspoonful of turpentine, for every twelve fowls. Mix the ingredients thoroughly.

Before feeding the mash, the birds should be starved for at least twelve hours. We recommend feeding a light ration the night before and then in the morning no difficulty will be experienced in having the fowls eat the treated mash. Ordinarily, if the fowls are not very hungry, they will not eat the mash, for the taste of oil of wormseed and the turpentine is not pleasant. Feed the treated mash again in the evening of the same day. On the morning of second day a dose of Epsom salts should be given. The salts may be given in a mash. Dissolve six (6) teaspoonfuls of Epsom salts for every twelve fowls in just enough water to moisten the mash. The amount of mash used varies according to the breed of fowls and to the individual attendant. Moisten the mash with this water and then feed.

It is essential that the birds have before them plenty of clean, fresh water at all times.

This treatment as outlined is for adult fowls. Proportionately less of the materials must be used for the young stock. If there are only a few birds needing treatment, the following is recommended:

A paste is made up as follows:
Two (2) parts charcoal, by weight.
One (1) part turpentine.
One (1) part Oil American Wormseed or Jerusalem Oak.

Two four-grain (4-grain) capsules are given to each fowl for two successive nights and on the following morning four-fifths (4-5) of a teaspoonful of Epsom salts in sufficient water to dissolve the salts is administered. (Rather than use the salts, we prefer to give two four-grain capsules filled with powdered rhubarb and two four-grain capsules filled with common baking soda.)

RELIABLE REMEDY FOR WORMS

Many of our students use and recommend the tobacco treatment for intestinal worms. We have used it with very satisfactory results. This treatment is 2 per cent by weight of powdered tobacco dust in the wet or dry mash for three weeks, that is, use 2 lbs. of powdered tobacco dust to each 100 lbs. of dry mash. The fowls do not seem to mind the taste and eat as much as ever. This is given to the pullets when put in laying house and we are never troubled again.

Experiments demonstrated that tobacco dust fed in the dry mash is an effective remedy for round worms. No harmful effects on the birds have been found. Its use has caused no decrease whatever in the egg yield of the flocks. On the contrary, an immediate and constant improvement in the condition of the infected birds has resulted in increased egg yield. The birds do not seem to detect the presence of tobacco dust in the mash, and therefore relish it and consume their usual quantity without the necessity of applying starvation measures. The use of tobacco dust is recommended in flocks that are known to have round worms.

Tobacco dust should be fed in the mash daily for a period of at least six weeks in the proportion of 2 per cent by weight, or two pounds of the tobacco dust to each 100 lbs. of the ground feed.

And not only is tobacco dust effective where fowls are known to be infested with worms already, but successful poultrymen use it as a preventive. They begin on chickens three months old, giving one pound to each thousand birds daily for three months, mixing it in the dry mash.

Get rid of the worms and allow the fowl its full strength and vitality to ward off or successfully fight the disease germs. Other treatments for worms are given in detail in Lesson No. 25 on "Enemies and Parasites."

LIMBER NECK AND WRY NECK

A bird is said to have limber neck when it loses control of the neck muscles. The head falls forward, sometimes resting on the ground between its feet. In cases of wry neck the head is twisted to one side or drawn convulsively backward. It is an affection of the brain, frequently caused by an injury of the head. Birds usually contract limber neck by eating decaying meats which contain ptomaine poison, or it may be brought on by over-eating dry feed when the fowls do not have access to water, or any other cause which might bring on acute indigestion. The best thing to do is to discover and remove the cause.

CAUSE OF LIMBERNECK.—During the summer months considerable losses to poultry keepers are often caused by this trouble. Limberneck is a form of paralysis in which the bird loses partial or entire control of the neck muscles so that the head falls to the ground or the neck hangs limp. Limberneck has long been considered as a symptom rather than a disease and outbreaks of limberneck are commonly observed where the fowls have had access to partly decayed flesh. The exact nature of the trouble has not been well understood but observers have generally advanced the theory that some poisonous substance develops in putrid flesh which causes paralysis of the nerves controlling the neck muscles when eaten by chickens. Some poultry keepers have advanced the theory that the maggots which develop in dead carcasses in fly time would produce limberneck when eaten by chickens, while other observers have noticed that in many cases the chickens eat fly maggots without any apparent ill effects. Recent experiments at the University of Minnesota indicate that the maggot of at least one common fly is an important cause of limberneck in chickens, and the facts already noted by the Minnesota investigators open a field which may lead to further important discoveries with regard to the nature and cause of limberneck. In the Minnesota experiment limberneck symptoms were produced in a White Leghorn cockerel by feeding the maggots of the green bottle fly taken from the head of a hog which had died from paralysis. Larvae of this same fly taken from the body of the White Leghorn cockerel and fed to a Rhode Island Red chick caused death within a few hours from limberneck symptoms. Green bottle fly maggots taken from the Rhode Island Red chick and fed to a large guinea pig caused paralysis of the pig's hind quarters. In the Minnesota experiment maggots from the common house fly and from the blue bottle fly developed in the body of a limberneck chicken produced no ill effects when fed to other chicks, and no limberneck symptoms were produced by feeding chicks the larvae of green bottle flies produced on fresh meat. These experiments indicate that the green bottle fly is at least one important carrier of the cause of limberneck. The evidence seems to indicate that limberneck is particularly likely to develop in chickens when the green bottle fly eggs are lain in the flesh of animals which have previously died from paralysis. Further investigations may show that limberneck is transmitted by certain of the flies and may also show a relationship between limberneck in chickens and symptoms of paralysis in hogs and possibly in other animals. So far the Minnesota experiments have not suggested a cure for limberneck, but they emphasize the importance of keeping the premises clear of all decaying animal material which might provide a breeding place for the green bottle fly.

TREATMENT—Limber neck is usually easy to remedy, but in severe cases of wry neck the only thing to do is to kill the bird. When first discovered in small chicks, they should receive a dose of from two to ten drops of oil of turpentine mixed with an equal quantity of sweet oil. Prepare a ginger tea, made by mixing one teaspoonful of powdered ginger with one-half cup hot milk and sweeten with a little sugar. Adult fowls may have from one to two tablespoonfuls at a dose, but small chicks require only one-half to one teaspoonful every hour or two. When they begin to show signs of improvement, give a little throughly cooked rice, and follow this by feeding a limited supply of grains, and also furnish them with a plentiful supply of raw vegetables or green food of some sort. When symptoms of the disease are first noticed feed very sparingly for a few days.

We have been quite successful in curing cases of limber neck in mature fowls by the use of turpentine and sweet oil. Mix about a teaspoonful of turpentine with the same quantity of sweet oil, then moisten a little bread with this and force it down the fowl's throat. If the turpentine and sweet oil can be given in large capsules, so much the better. The treatment should be given for two days in succession. About every hour or two the head of the bird should be held upward, beak opened, and a spoonful of sweet milk poured down the bird's throat.

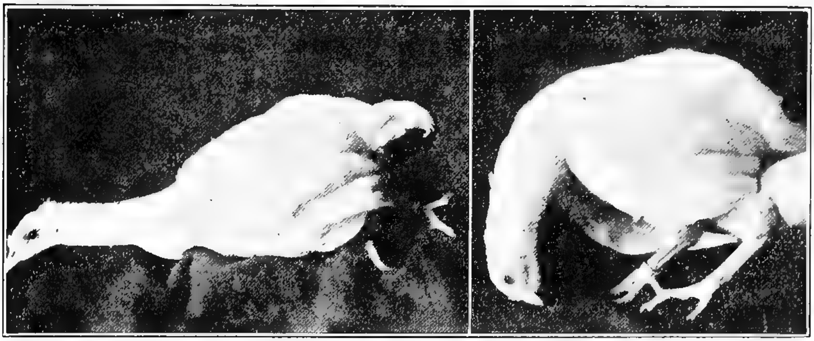

Fig. 38.
A case of Limber Neck.

VENT GLEET

SYMPTOMS.—Vent gleet usually has its beginning with the female, and by her is transmitted in copulation to the male, and by him to others in the flock. Upon examination you will find the mucous membrane in the early stages to be dry, red, hot and swollen. The tenderness and inflamed condition of the cloaca produces spasmodic contraction of the vent, and the bird endeavors to drop excrement when the cloaca is entirely empty. The first discharge is thin and watery, and later becomes white and offensive. This collects upon the skin and feathers about the vent and irritates the parts with which it comes in contact.

TREATMENT.—The most satisfactory treatment we have ever used is as follows: Take a pan of warm water, as hot as one can bear his wrist in, and pour in a tablespoonful of zenoleum or creolin. Hold the diseased portion of the bird in this water from ten to twenty minutes. Remove all the excrement or discharge which has accumulated on the feathers or skin, then inject a solution of permanganate of potash and water made about a rich wine color. Or you may inject a weak solution of warm water and zenoleum or creolin or a similar disinfectant. We dust all sore places after each bath with one part of iodoform to six parts boracic acid powder. After two or three weeks' treatment, if the birds show no sign of improvement, we advise killing and burning it. While the bird is being treated be sure to keep the bowels loose by giving Epsom salts every other day.

When nothing else would answer we have found the following remedy very simple and effective:

First of all, remove all affected birds to the hospital and disinfect. Give each affected bird a teaspoonful of Epsom Salts and after the bird has evacuated freely, mix the following:

Napthalene	10 grains
Sulphur	¼ ounce
Nut Gall	10 grains
Carbolated Vaseline	2 ounces

Mix thoroughly and with it saturate a pledget of cotton and place it in the cloaca (rectum), allowing it to remain until expelled by the bird. Give internally five drops of turpentine, mixed with flour, twice a day.

DROPSY

This disease is recognized by an accumulation of a large quantity of liquid in the abdominal cavity. In some cases the abdomen becomes so enlarged that it is quite noticeable. Upon examination it is usually found to be soft and gives a sensation of a sack filled with liquid. In young chicks it may be brought on by bad feeding, unsanitary conditions or indigestion. In the older fowls it is usually caused by mild cases of Peritonitis or by a Tumor. In some diseases of the abdominal organs the birds are usually more or less listless and appear to be more or less feeble. It is usually best to kill birds thus affected.

Some cases may be cured by tapping the abdomen with a hollow needle and allowing the fluid to escape. Iodide of Potassium or Iodide of Iron in one-grain doses is recommended by some.

APOPLEXY

With this disease the birds usually drop dead or become paralyzed, having shown no previous signs of illness. Upon examination of the dead birds, the only evidence of any trouble that can be found is a clot of blood. In most cases this will be found on the brain and frequently in other portions of the body. Birds thus affected are usually overly fat and sometimes die on the roost. They often die while straining to lay, or will sometimes fall over dead as they stoop to pick up feed. Fright, over-exertion, or strain causes the blood vessels to rupture. Where birds have been allowed to become overly fat the walls of the blood vessels are degenerated and become very thin and tender, due to rich food or to over feeding. There is no way to treat such cases. Anything that is advertised or recommended as a cure for apoplexy is a fake. Modify your rations; reduce the amount given. Give more green food and provide plenty of range, if you have several successive deaths as occur from apoplexy.

HEAT PROSTRATION

In extremely hot weather where birds are being trap-nested, the hens may suddenly drop insensible or appear to be paralyzed. A condition approachng apoplexy results. As soon as such cases are discovered, the bird should be held under a hydrant and the cool water allowed to run over its head and body, or a tub of fresh, cool water should be drawn and the bird dipped in this until it shows signs of recovery. Provide a natural shade and protect your fowls from the extreme hot sun during the middle of the day.

TREATMENT FOR POISONS

You should be careful to protect your birds from poisons of any kind. If you use Mercurial ointment as a treatment for lice and use it too freely it will poison the system of your fowl, or if you feed sulphur in large quantities for any considerable length of time your birds will become poisoned.

We recently had three fine R. I. Red pullets sent to us by a prominent poultryman and when they reached our Experimental Farm two of them were in such a condition that you would not have thought they could live over night. All three of the birds would tremble when they attempted to stand; their heads and neck would move back and forth, and when they attempted to walk they could not do so, but would tumble on their heads, and could not even control their heads and neck so that they could eat, and their bodies were nothing except skin, bones and feathers.

Upon investigation, we found that the party had been feeding large quantities of sulphur and cotton seed meal for a considerable length of time. A great number of his birds had died during the past year and a half; all showing the same symptoms and he thought it was some very contagious disease. We gave each of the birds two 4-grain capsules, one filled with powdered rhubarb and the other filled with common baking soda. Two of these were given at night and two the following morning.

We also forced a long rubber tube or catheter down the bird's throat and into the crop. On the other end of the tube or catheter we had a small funnel and into this we poured equal parts of egg and fresh milk which had been beaten and thoroughly mixed. We saw that each bird got the contents of one egg and an equal quantity of milk each morning and night for the first two or three days. In two weeks' time the birds had fully recovered. This is a very good remedy for any kind of poisoning.

SETTING BROKEN BONES OF THE DOMESTIC FOWL

The first thing to do where bones have been fractured or broken is to replace the bones in as nearly a perfect position as possible so that the normal shape of the bone is restored. The next thing is to apply apparatus for holding the bones firmly in place until the broken portions can become united. In applying the splints or apparatus for holding the bones together, you must be careful to see that the circulation of the blood and the nerves are not interfered with. After the setting is completed, the bird must be provided with a clean coop in a dry, comfortable place, where it will not be interfered with by the other birds. Good food and water must be provided.

The feathers in the region of the broken bone, if there are any, must be removed. Then apply a thin layer of cotton, and be careful to hold the fractured part in proper position. Next apply about three narrow, thin, wooden splints, or more if necessary. These must be applied in such a way that they will not chafe the skin or make a sore spot. It is usually best to have the splints somewhat shorter than the bone that is to be repaired. The splints should then be wound with a one-inch cotton bandage and the end of the bandage should be sealed with a good quality of glue. Some adhesive plaster or glue must be used to run from the bandage proper, one end of same being attached to the bandage, and the other end to the skin or feathers of the bird so as to hold the bandage in place and not allow it to drop down or slip off of the fractured bone. The appliance used to hold the broken bones in position may be removed with safety by the end of the twelfth or thirteenth day. It may be necessary to examine the bandage occasionally to see that it is in proper position, and see that no unlooked for trouble has resulted.

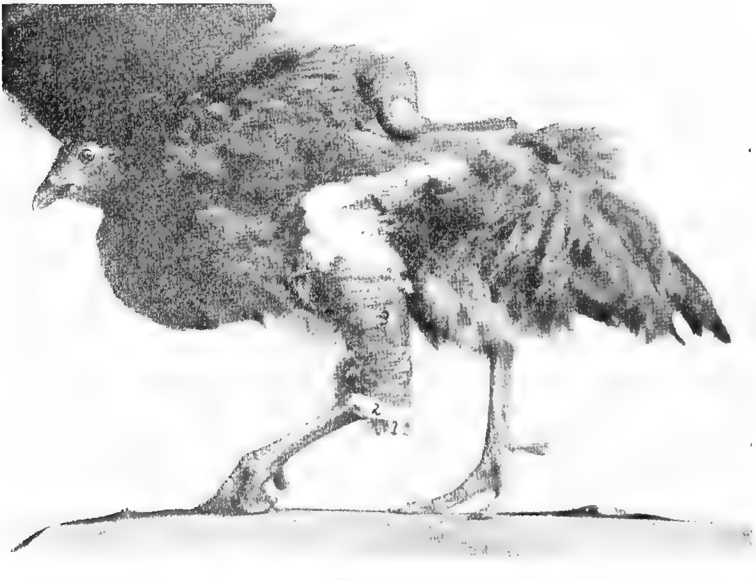

Fig. 39.
A four-months-old S. C. Rhode Island Red pullet with a broken tibia. Properly set, using splints (No. 1), cotton (No. 2), one-inch cotton bandage (No. 3), and glue.

It seldom pays to attempt to repair broken bones unless it is in the case of a valuable bird. Where it is thought wise to attempt such work, we would advise the method used and recommended by the North Carolina Experiment Station. The accompanying illustration was taken from their technical bulletin on this subject.

"This shows a fracture with adjustment and appliance in place. This is a fracture of a tibia in a three-pound Single Comb Rhode Island Red pullet. The appliance consisted of cotton, wooden splints, one-inch cotton bandage and glue. Glue has proven the most satisfactory.

"At the end of twelve or thirteen days, carefully remove the appliance, dissolving the glue or starch in warm water. Confine the bird for a few more days longer in a separate compartment.

"In feeding for the first two or three days it is well to feed mash or bread soaked in milk, and then gradually feed corn, wheat and oats, as for other fowls, and give milk or water to drink. If there are no internal injuries or other complications the birds will not greatly suffer.

"In applying the bandage to an open fracture, it is best to place a small piece of cork or wood over the wound and, after applying the dressing, cut down through the dressing and remove the cork. In this way a drainage window is established, and through this the wound may be treated daily with an antiseptic wash."

TREATMENT OF CUTS AND WOUNDS

Very severe wounds may be successfully treated by adhering to the following procedure:

"1.—Thoroughly wash the hands in warm water, using plenty of soap, before handling the wound at all. After the hands have been well scrubbed, rinse them thoroughly in a pan of one to one thousand bichloride of mercury solution and dry with a clean towel.

"2.—Pull out the feathers in the region around the wound and thoroughly cleanse it, using first warm water, and follow this with warm one to one thousand bichloride solution. A piece of clean, soft cloth or absorbent cotton may be used for this purpose. Make sure that the wound is thoroughly clean. Do not be afraid of hurting the bird. A little pain at the start is preferable to a dead bird later.

"3.—If necessary, sew up the wound, using a good size sewing needle and silk. Both needle and silk should be soaked in alcohol for fifteen minutes before using. Small wounds need not be sewed. Large ones will heal more quickly and more certainly if they are sewed. If the wound involves the muscles as well as the skin, sew it up in two layers one set of stitches including only the muscles, the other set only the skin.

"4.—Paint the skin in the region about the wound, but not the wound itself, with dilute tincture of iodine.

"5.—Powder the wound well with iodoform.

"6.—Smear a thick layer of the ointment over all.

"7.—If the wound is very severe bandage it with a clean cloth.

"The above treatment is only necessary in its entirety in very severe cases."

After all that has been said about germs and bacteria, it is astonishing how much fowls can stand in the way of infected wounds and bruises. Take, for instance, the process of caponizing. As a rule the instruments are not sterilized, not even the skin where the wound is made. The peritoneal cavity is opened and germs are carried in with the instruments and the wound left to close itself without any stitches. There is no reason why poultry surgery should not be practiced more than it has been. It can be carried out to a greater extent, and successfully, by using care in sterilizing the instruments and sterilizing the skin or place of operation before the incision is made. In case of tumors of the oviduct and in egg bound, instead of allowing the hen to suffer so long and letting her go in a weakened condition before something is done, learn the cause of her trouble in time and operate on her at once.

The accompanying illustration will show a Black Langshan hen which had six normal eggs in her body cavity. These eggs had passed to the uterus and the shells had formed, but they could not pass out; so they returned to the body cavity. An incision was made as shown in the cut. The eggs were removed, the peritoneal membrane was sewed together, also the muscles and skin. In six days the outer stitches were removed, and the hen was placed back in her pen, apparently well. She has since begun to lay. This was one of the National Contest birds and a valuable one. Several of her sisters died of the same cause before their trouble was discovered. The attendant was more observing in this case and learned the cause of the trouble in time. This and many other difficulties in the poultry industry can be solved, and the sooner all poultrymen get to studying these problems scientifically, the sooner they will be worked out.

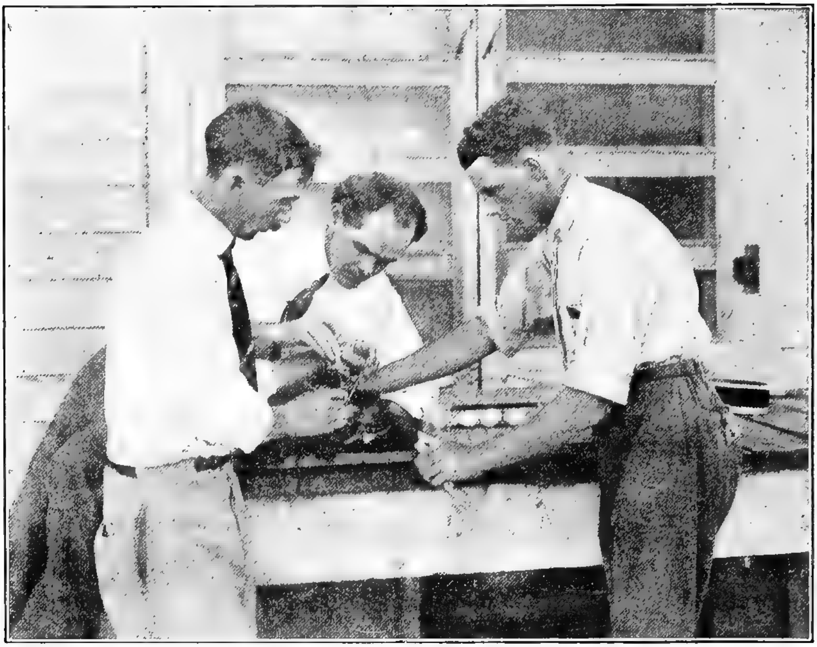

Fig. 40.
Removing six eggs from the abdominal cavity. The hen was soon laying again and in apparently as good health as ever.

TO PREVENT EXCESSIVE BLEEDING

Very often in operating on the comb of a bird that has been injured, or after the spurs have been cut off near the leg to prevent fighting, or after the beak of a bird has been trimmed rather close to prevent feather eating, the part may bleed freely and in some cases the bird bleed to death. In order to prevent this a stick of caustic may be used and applied to the injured part or a powder known as Tannic Acid may be applied to the wound. As a rule there is very little danger from excessive bleeding where the spurs of a bird are sawed off or cut near the leg.

BLACKHEAD IN TURKEYS AND WATER-FOWL DISEASES

It is impossible to cover this subject thoroughly so far as reviewing all the work that has been done in regard to these diseases. We refer our students to The Turkey and Waterfowl Lesson, which goes into detail regarding the treatment of these diseases.

DRUGS, THEIR VALUE, USE AND ABUSE

Dr. J. H. Pethersbridge comments on the value of drugs, their use and abuse as they appertain to the poultry industry, and his suggestions are so clear and valuable that we desire to give our students the benefit of this information as follows:

"I depreciate the employment of 'cruel' remedies; if you imagine no humane treatment will reach the trouble, don't torture them to death. Always keep a sharp hatchet in your medicine closet. I loath to recommend a *poisonous* drug, of either mineral or vegetable origin, for use with poultry, and believe in 90 per cent of the ills, it is ill advised.

"When I speak of a drug being a 'tonic,' I must not be misunderstood as saying that any tonic will atone for inherited lack of vigor. Or if I have occasion to refer to a drug as 'stimulating,' I do not mean that a stimulant will take the place of good food, well balanced and seasoned with pure water, fresh air, sunshine and exercise. And I desire you to bear in mind that no drug has the power to cure without the co-operation of care, cleanliness and common sense. And, finally, I desire to emphasize that in my recommendations of treatment and dosage, I will refer only to adult fowls and maturing stock.

"*Drugs*:—Extended notice given only to such remedial agents as are well known, easily obtained in any community and so cheap that their employment makes no material addition to the expense account. Drugs of high potency, valuable doubtless in the hands of an expert, but a menace on ordinary use without experience, drugs that are not dependable because of deterioration and chemical change upon exposure to light and air, and drugs difficult to procure and too costly for a profitable 'cure,' will only be referred to briefly or mention entirely omitted.

Sulphur

"No mineral is more widely diffused throughout Nature than sulphur. In volcanic deposits it is found in its purest state and called 'native,' though it is also abundant in combination with the ores of copper, lead and antimony, wherever these ores are found. Sulphur is also present in the animal and vegetable kingdoms. Among vegetables, the mustard and other cruciform plants show the greatest content of sulphur and the disagreeable odor of some plants, as garlic and asafoetida, is attributed to the sulphur they contain.

"The discoloration of the silver spoon with which you eat your breakfast eggs is caused by the sulphur in the eggs, and if one happens to prove 'bad' in the breaking it is the sulphur in the form of sulphurated hydrogen that salutes and outrages your olfactory nerves and takes away your appetite for that particular meal. A combination of crude sulphur, oxygen and water gives us sulphuric acid, invaluable in the arts and industries of the world. Sulphur is also in active demand for the manufacture of gunpowder, fireworks, in vulcanizing rubber, bleaching, and in combination with lime has grown almost indispensable as a spraying insecticide and fungus destroyer.

"The form of sulphur best adapted for use by poultrymen is known as the 'flowers of sulphur,'—a fine, yellow powder, having a slight characteristic odor and faintly acid to the taste. It is insoluable in water, but soluble in alkaline solutions, petroleum, turpentine, alcohol and others. Takes fire at a temperature of 300F. and burns with a blue flame, combining with it the oxygen of the air to form a vapor fatal to all living organisms if burned in a closed room.

"There is no surer way of killing the red mites than burning sulphur in a tightly closed house, but instead of sprinkling the powder on hot coals in a pan, I advise buying the sulphur candle, if procurable, as far safer for fumigation. But do not bid Biddie come back to her coop, after fumigating with sulphur fumes, until you have thoroughly aired the house.

"Before leaving the 'house' allow me to suggest that the next time you renew the dusting boxes, you mix with the 'dust' in each box 3 or 4 ounces of sulphur.

"Medical Properties.—Sulphur is a laxative and diaphoretic—that is, it is a mild cathartic and induces abundant perspiration. It is supposed to be rendered soluable by the soda of the bile. It is also carried into the circulation by the fatty matters in the alimentary canal. It evidently passes off by the pores of the skin, as is shown by the fact that silver carried in the pocket of one taking sulphur becomes blackened.

"Medical value in the poultry yard.—The elder generations of my readers can recall the customary spring dosing of sulphur and molasses to every member of the family and if any dodged the morning dope, it was not the kids. It wasn't exactly peaches and cream to the taste, but it was 'good medicine' for a general spring cleaning, not infrequently needed, after a winter's diet of buckwheat cakes and sausage.

"To our mind this conveys a lesson of a possible poultry need after a winter of confinement and heavy feeding for eggs. As spring approaches, add to each quart of your dry or moistened mash a heaping teaspoonful of sulphur; mix thoroughly and repeat two or three times a week for a month.

"When your birds have free range and lots of it, the addition of sulphur to their mash is superfluous, as they obtain this element from the greens they select and eat, but an occasional addition to their feed through the winter months is desirable, as well as the spring treatment.

"Out of the southland, where chicken-pox or, as locally known, 'sorehead,' is almost epidemic in the fall, there has come of late a preventive treatment for this nasty disease, so often reiterated and substantiated, that it cannot be ignored. The treatment is as follows: About the first of July, once a week dissolve a tablespoonful of Epsom salts in warm water and with it moisten enough mash for a dozen chickens, every third day also add the same quantity of sulphur to their mash and keep up this alternate treatment until the first of October.

"I confess my training and experience gives me no clue as to *why* or *how* this treatment makes the flock immune from chicken-pox, but some things we only know by the results and cannot trace the processes by which said results are obtained. If a three months' course of salts and sulphur will prevent a visitation of chicken-pox, it is cheaper to accept the fact than question the theory.

"Northern poultrymen will do well to try this out, for this disease is growing more and more prevalent in all the Northern States.

"The Cost.—'Flowers of Sulphur' is inexpensive. It can be bought by the barrel for less than 9c a pound. When you go to the drug store for it, don't ask for '5c or 10c worth,' but buy it *by the pound*. It should not cost you over 10c per pound, but if you ask for '10c worth,' you are not likely to get more than four ounces. No, I am not insinuating that the druggist is dishonest; I am only, as a former druggist, putting you wise as to how to ask for and buy the cheaper drugs. As for honesty and fair dealing, the average druggist will not suffer in a comparison between him and the average poultryman.

Iron

"In the animal economy iron is an essential constituent of the red corpuscles of the blood; in anaemia the blood is deficient in iron not because there exists less iron in the red corpuscles, but because where there is anemia there are fewer red corpuscles. One of the reasons why it is necessary to supply our 'shut-in' fowls with an abundance of 'greens' is the bird's need of the mineral salts the vegetables afford in an easily assimilated form. And chief among these minerals is iron. Greens particularly valuable for their iron content are lettuce, spinach and freshly cut alfalfa and clover.

"Iron is one of the few metals which are not deleterious to the annual economy. It is pre-eminently a tonic in run-down conditions and blood impoverishment from any source. It should not, however, be given to fowls suffering from any inflammatory disease, as it excites the circulation and will increase the fever, thirst and difficulty in breathing.

"Preparations of iron, available and desirable with poultry—the practical question arises—which of the preparations of iron are best adapted to promote the formation of the red content of the blood, are most easily assimilated, readily obtained and inexpensive? Probably the most easily assimilated, is metallic iron, or as known in the durg store, reduced iron or iron by hydrogen, administered with the food and not on an empty stomach. Dose to an adult fowl, one to three grains, twice daily in the form of a pill or powder.

"This 'reduced iron' yields the largest proportion of iron to the gastric juices, but there are two serious objections to its employment by poultrymen,—first, the labor and time required for the preparation and individual administration and, second, the difficulty, owing to its liability to oxidation and consequent deterioration, of buying a really good article of reduced iron and keeping it so. If, however, the poultryman has only a few birds that need treatment and he can procure from his druggist 3-grain pills of the carbonate of iron (Blaud's pills), made by a reputable manufacturing pharmaceutical house, we would advise purchasing a hundred pill package and giving each bird one pill a day. One hundred pills can be purchased for 25c. Probably, though, the preparation of iron that is most desirable for the poultryman's medicine closet, convenient, safe, active and inexpensive, is the tincture known as the tincture of the chloride or muriate of iron, or more often simply as the 'tincture of iron,' and obtainable in any drug store for from 5c to 10c per ounce. It is one of the most active and certain preparations of iron and can be given in the drinking water.

"Anaemia, which is a condition of the blood, characterized by lightness of color, loss of albumen and fewer than normal red corpuscles, evidence of which condition is shown by a light red or yellow comb and wattles, listlessness, poor appetite and failure to make normal growth or flesh. Fortunately anaemia is no longer common, owing to better care, and the knowledge that air and sunshine in sanitary surroundings are essential to the fowl's health. A teaspoonful of tincture of iron should be added to a pint of their drinking water and this should be continued for several weeks, gradually reducing the amount of iron given. To enumerate other or all diseases of poultry in which the administration of iron may be helpful is beyond the purpose of this article and superfluous, if you keep in mind that iron is emphatically a tonic. It is useful after all debiliating disorders to 'tone up' the system through the circulation. In using sulphur in the mash as indicated above, we esteem it a very desirable assistant to the sulphur to occasionally add a teaspoonful of tincture of iron to the drinking water.

"*Caution.*—Do not mix or combine tincture of iron with any vegetable tincture, for the iron will be thrown down in the shape of insoluble tannates. We consider this caution necessary, for we frequently see recommended in the disease department of poultry journals the use of iron with nux vomica and even belladonna, and as those are drugs of high potency, such combinations are particularly dangerous.

"Do not attempt to give your fowls a course of iron treatment by placing iron nails or filings in their drinking fountains; the resultant yellowish-brown deposit on bottom and sides of vessel is only rust and adds no medicinal value to the water.

"Do not imagine that by dissolving copperas (the impure sulphate of iron) in their drinking water you are giving them an iron tonic. When iron is combined with a mineral acid, such as sulphur, phosphorous, etc., the best authorities claim that the combination adds no iron to the blood but acts solely as an astringent. Copperas is by no means a safe internal remedy for poultry; in solution in water it is a powerful disinfectant and arrester of decompositions, but even in this connection it is considered to be of but feeble value as a germicide.

"Our interest was recently aroused by an article appearing in a well-known and widely circulated farm journal, giving a highly endorsed (by the correspondent) formula for an egg-laying compound. The principle ingredient was copperas with generous additions of venetian red and cayenne pepper and smaller portions of blue vitrol and saltpetre. If his birds didn't lay more eggs on that 'seasoning,' they should have shelled out a few bombs of 'red fire.'

"Cream of tartar is a mild saline cathartic and Rochelle salts (a tartrate of potash and soda) is also a cathartic of somewhat more vigorous action, but if you have occasion to use a laxative or cathartic for your birds, Epsom salts will cost you less and give equally good results.

"We have at sundry times in various poultry publications noted the advising of iodide of potash for rheumatism; it doubtless is good, if the treatment is sufficiently prolonged, but in view of its cost and the fact that rheumatic conditions can only exist or be developed under conditions of neglect or improper housing, the best remedy is to locate and correct the error.

"The chlorate of potash either alone or mixed with sulphur is sometimes recommended to be dusted into the throat in inflammatory, cankerous and diphtheritic disorders, and without question the action of these drugs on such surfaces is very efficient, but we think the better way of applying the chlorate would be to dissolve one part in ten parts of glycerin and swab it on the diseased membrane. And it is a safe rule to never mix the chlorate of potash with any other drug. Adhere to this rule and you will never invite an explosion.

Permanganate of Potash

"In visiting the poultry yards of the country it is surprising to see so many fowls being served with pink tea in place of pure, sparkling, fresh, clean water. In reading the advice tendered in the poultry press, considering the many diseases and conditions for which a solution of permanganate is recommended as a specific and cure, one is fain to infer that for poultry it is the 'elixir of life.' Owing to its popularity and its widespread use, it requires some moral courage to throw a doubt on its efficiency.

"In the writer's opinion, permanganate of potash is the most overrated drug in use by poultrymen. In consequence of the facility with which it parts with its oxygen, it is a powerful oxidizing agent, but as it can yield up only the oxygen within it, its powers are limited even in this field. It is efficient as a disinfectant in lessening and destroying fetid odors from organic substances.

"It may be kept indefinitely, if pure, and can be fully secured from contact with organic substances or other decomposing agents, but, in fact, in consequence of the almost universal presence of organic matter in the air, it is generally partially decomposed when purchased or in ordinary handling becomes so.

"It can have but little value as an internal remedy, given through the medium of the drinking water, for even allowing that exposure to the air has not affected it, the saliva of the mouth and the secretions of the gullet and stomach will decompose it before it can be absorbed.

Lime

"It is highly essential for us to know the importance of the minerals involved in the fowl's organism, their economical sources of supply, and be able, in a measure, to recognize and interpret the distress signal that an abnormal condition invariably applies. True it is that the well bred fowl with unlimited range and natural environment finds and appropriates without direction of ours, all those mineral elements that it stands in need of, but in these 'shut-in' and 'intensive poultry culture' latter days, hundreds of thousands of our birds are handicapped (or rather foot-bound) and entirely dependent upon our discernment and knowledge with but little opportunity to exercise their instincts.

"Although but 5 per cent of the body weight of the fowl consists of mineral matter, this seemingly small percentage has most important functions to perform in the upbuilding and support of the bony structure and in the regulation of the density of the blood and digestive fluids of the stomach and intestines. The main source of supply of this mineral matter lies in the grain, the mash and the greens we feed them, but in addition to this organic mineral matter, a certain amount of inorganic matter is required for the formation of the egg shell and the proper development of the frame in the immature bird. In most situations this must of necessity be an artificial supply and as the mineral most in demand is lime, crushed shells, grit and ground bone may be our main reliance. It is asserted that one pound of oyster shells contains sufficient life for the shells of seven dozen eggs.

"*Calcium Carbonate* is the most abundant and widely distributed calcium salt in Nature. Familiar to us in the form of limestone, shells and chalk.

The subjections of limestone and shells to intense heat, drives off the carbonic acid and gives us an oxide, the lime of commerce, or as familiarly known, 'quick lime.'

"The value of crushed shells kept in a hopper before the flock is mainly to supply the females with shell making material for which purpose nothing can be cheaper or better. As a mechanical aid to digestion, crushed shell also fills some of the functions of grit, but as a bone builder, I am disposed to think shells have but little influence, there being in bone less than 4 per cent of the carbonate to 57 per cent of the phosphate of lime.

"Chalk is a native friable carbonate of lime and the world's supply comes largely from the chalk cliffs and beds of England, France and the United States. There is no pharmaceutical product of chalk I can recommend for the poultry trouble with diarrhoea accompanied by acidity. Freshly prepared by the druggist, a teaspoonful of 'Chalk Mixture' poured down the throat of the ailing bird at intervals of two or three hours should remedy the condition in a day's treatment unless there happens to be other more serious complications.

"*Quick Lime* is soluble in about 700 parts of cold water. A little water sprinkled on lime is rapidly absorbed, with the evolution of much heat and vapor. This constitutes the phenomenon of 'slacking,' the first step in 'white-wash' preparation. And allow me to interlope, if you should have a bird you believe is suffering from diphtheretic roup, and you haven't killed it because it cost you good money, hold it head downward for a few seconds over the heat and vapor of some 'slaking' lime; do this several times at intervals long enough for the sufferer to get a breath of fresh air in its lungs, and you may effect a gratifying 'cure.' For use, however, as a disinfectant, purifier and for the soil, lime is better 'slaked' without the addition of water, by simply exposing it to the atmosphere, and this we know as air slaked lime. The addition of one or two handfuls of air slaked lime to the sifted coal ashes many use on dropping board and in dusting box, will destroy all offensive odor and materially aid in routing body lice. The lime should be sifted and the lumps discarded for these may be unslaked and if eaten by the chickens will do serious damage to the digestion. In event that any of your birds give evidence of bronchial trouble cease using the lime for a time, as lime dust is extremely irritating to the air passages.

"There is no more effective soil sweetener or disintegrater of heavy clap soils than air slaked lime. Before spading or plowing up poultry yards that have become foul by long usage and lack of growing vegetation or infected by a visitation of a contagious disease, give the yard a heavy top dressing of air slacked lime and turn under; let it rest for a few weeks with several stirrings up with harrow or rake, and grow a green crop upon it before again using it as a run.

"*Lime Water.*—Two ounces of quick lime, slake with 4 ounces of water in a gallon bottle, agitate frequently for an hour with the addition of a half gallon of water, allow to settle and pour off this water. Then again fill up the bottle with fresh cold water and again agitate; cork tightly and set aside until use arises for it. Lime water is a valuable antacid and astringent and the clear solution in the bottle may be given full strength to the poultry in one of their fountains (but not metal ones) for the same purpose for which I recommend chalk mixture.

"For quick relief to a burn, mix lime water and linseed oil half and half, and apply freely to the burned surface.

"*Sulphate of Lime.*—The combination of lime native in the different varieties of gypsum rock, hence the common name of gypsum for the crushed and ground crude, impure sulphate. It is also designated as land plaster. It had no medicinal use as an internal remedy, but is utilized by poultrymen as a deodorizer and absorbent under the roosts. Valuable to the agriculturist as a fertilizer—either alone or in combination with other chemicals, indispensable to the mechanic in many divers employments, sulphate of lime is worthy of more extended notice.

"*Phosphate of Lime* is the principal mineral content of bones. Burned to a white ash, the residue shows over 57 per cent of phosphate of lime, and it is from this source we obtain phosphorus and all its compounds directly or indirectly. To furnish our flocks or individual birds, therefore, with the phosphate of lime, absolutely essential to the formation, growth and maintenance of their bodily structure and proper nutrition, I believe we need look no further than this original source of all other compounds of phosphoris acid and lime.

"The precipitated phosphate of the drug store, the hypophosphite, the lactophosphate and the phosphide of lime, all have their distinctive application to the needs of human organsims, but they offer no remedial or constructive elements to our birds that a good quality of bone-ash, bone-meal and granulated bone does not afford at one-tenth cost. And the highly important score of economy must never be lost sight of in our selection of remedial agents for domestic animals we 'raise' for profit.

"*Bone-ash* is the mineral residue of burned bones, the heat destroying all animal matter and driving off the carbon.

"*Bone-meal* is the dried ground bone, varying in fineness from flour to the granulated and retains all the animal matter.

"It therefore follows that whereas bone-ash offers the greater proportion of the phosphate, it lacks the food value of the meal and granulated bone.

"*Leg Weakness* in chicks and growing stocks. While there may be and in most cases are contributing factors such as too warm floors in the brooder, imperfect ventilation, too close confinement, lack of exercise and overcrowding, the underlying cause of leg weakness is feeding a ration too rich in fat and flesh forming constituents and too poor in ash and bone-making material. The chicks gain in weight faster than they acquire strength.

"The amount of corn and corn products should be lessened materially or for a time discontinued. Every mash fed, whether dry or moist, should contain the best quality bone-meal you can procure to the amount of 2 pounds in a 25-pound lot. And I would further recommend that in addition to the individual hoppers of grit, charcoal and shell you ad one for granulated dried bone. (I do not advocate green cut bone or blood-meal for immature stock).

"*Chlorinated Lime* (Chloride of Lime—Bleaching Powder.)—I presume there is not a reader but knows the familiar one-fourth, one-half and one-pound pasteboard or metal boxes in which this valuable disinfectant, deodorizer and germicide is offered for sale, but it may not have occurred to some why it is not sold in bulk. Owing to the readiness with which it parts with the chlorine upon exposure to the air, it rapidly deteriorates if kept in other than sealed containers. The value of chloride of lime, for the purposes named, depends upon the chlorine gas content. It is said that chlorine if present in the atmosphere in even the small proportion of 1 to 100 is able to destroy all disease germs, provided the air and the objects or substances to be disinfected are moist and the room tightly closed for a time. This offers a convenient and cheap method of disinfecting poultry houses that can be closely closed, involving less labor than usually called for in the use of other agents. Particularly so, if your water supply permits the service of a hose to thoroughly wash down all the interior.

"Ridding the house of excess water, but while everything is still damp and the air moist, sprinkle chloride of lime around liberally and close up house tightly for several hours. Then open up, sweep out the lime and allow the sunshine and air to complete the job.

"Open boxes of chloride of lime should not be permitted to stand around the poultry house for deodorizing purposes; it soon becomes valueless for this purpose but always remains a menace to your birds in that, taken internally, it is a corrosive poison.

"*Calcium Sulphide* (Sulphuretted Lime).—A combination of lime and sulphur that is highly recommended for the treatment of canker, diphthetric condition, chicken-pox and sore-head. As a local application for pus formation, canker and diphtheria, it is applied directly but sparingly to the diseased membrane by means of a glass or metal tube.

"Upon the first indication of an outbreak of chicken-pox in your flock (and its appearance upon one cockerel or cock is sufficient indication, even if you isolate him immediately) the 'American Poultry Doctor' advises the thorough mixing in the moist mash, once a day, of 1 grain to each adult bird and the treatment kept up for a week. Half grown birds, ½ grain. The application to the sores of any good coal tar ointment and a thorough cleaning up and disinfection of the premises, with a material reduction in the amount of 'meat' fed while under treatment, in addition to the calcium sulphide, is said to control and cure this nasty and far too prevalent disease.

"Calcium sulphide may be purchased through your druggist in one or four-ounce bottles, the latter package retailing for about 50c. If the top portion in the bottle shows a lighter color, throw this part away, for it is probably inert.

"Should you have no small scale upon which to weigh out the required number of grains, counting a grain for each bird, ask the druggist to place a daily portion in each of seven small vials, tightly corked. The additional cost is justified by the accuracy and activity assured. Much of the calcium sulphide on retail drug shelves is inert and valueless, because in stock too long or too often exposed to the air. Buy it only in the original container and insist upon a fresh article. Do not mix it with the mash until feeding time and if they leave any portion of the mash uneaten, remove and throw it away.

Soda and Magnesia

"*Carbonate of Soda*, familiarly known as sal soda or washing soda, appeals only to the poultryman as a cleansing agent, its medicinal value being better exhibited in the bicarbonate.

"Galvanized iron hoppers, troughs, brooders and drinking fountains are coming into more general use and are to be commended for cleanliness and durability, but they nevertheless demand occasional thorough cleansing. Make a strong solution of sal soda in a tub of hot water, immerse the utensils with a small mop (for sal soda is bad for the hands) wash thoroughly in the soda water, rinse in clean water, and set in the sun to dry and sweeten. You can clean a tin can that has held rancid castor oil by this method and I know no other cheap cleaner that will accomplish this.

"*Bicarbonate of Soda*, better known as baking soda, being milder and more acceptable to the stomach than the carbonate, should always be selected for internal use or external application. It is preferable to the same salt of potash, as a simple alkaline remedy and antacid, because soda being the natural alkali of the blood and other liquids of the animal organism, has no general effect on the system.

"If from overfeeding or through the consumption of fermenting grain or soured mash, any of your birds give indication of having a 'sour crop' with resulting acidity of the stomach and intestinal contents, nothing will give them speedier relief than a teaspoonful of a solution of one dram of baking soda in an ounce of water. Two or three doses at intervals of three hours should relieve the condition.

"*Sodium Borate*, or borax, too well known for household utilities for a repetition in this place, but its value as a poultry remedy has not been so generally recognized and calls for brief mention.

"The properties of borax recommend it in poultry 'practice' consist in its being poisonous to the lower form of life, as exhibited in vegetable parasites, its antiseptic qualities and its soothing action on the mucous membrane, borax being nearly free from irritating properties. Borax being only slightly soluble in water, when so used as a wash, should be a saturated solution—that is, all that the water will dissolve.

"In treating favus or any scaly diseases of the skin, the head, the neck and any other parts of the body showing the scale or effects of same, as the loss of plumage, should be thoroughly washed with borax water and dried before applying the healing ointment or oil with which you finish the treatment.

"Borax water is further recommended for a wash for conjunctivitis, an inflammation of the membrane lining the inner surface of the eyelides, and to swab out the mouth and throat in ulcerated conditions. In the preceding suggestionc, if you prefer, in place of the borax, you may substitute boric or boracic acid—five grains to the ounce of water. The therapeutic action of the acid is identical with refined borax, but the latter costs less and is usually on hand.

"*Sodium Silicate*, the popular and trade name for same being water-glass. As an egg preservative, for the market poultryman of moderate production, the most convenient, economical and effiicient cold storage trust buster available. Eggs preserved in water-glass for three months should in every respect compare favorably with strictly 'fresh laid,' provided they are fresh and clean when placed in the preservative solution. Preference should also be given to infertile eggs.

"One gallon of water glass, costing 50 cents, in 10 or 15 gallons of water, should be sufficient, in a suitable receptacle, to cover 50 dozen eggs, hence it should not cost over 1c a dozen to hold a few hundred dozen over a falling market.

"The water used for mixing with the water-glass should always be boiled, allowed to settle until cool. In insisting that only clean eggs be preserved, it was not intended that they be made clean by washing. This must never be resorted to in any method of egg preservation. The water-glass solution should overflow the top layer of eggs at least two inches.

"*Sodium Chloride* (Common Salt), recognized from the earliest antiquity for its essential usefulness to man and beast; frequently referred to in the Bible, both literally and figuratively, called 'divine' by Homer, and referred to by Plato as a 'substance dear to the Gods.'

"We all recognize the necessity of giving our domestic animals either ready access to salt or incorporating a small portion in the food. Do we do it simply because we feel that they have an instinctive relish for salt, that it will increase their food consumption by rendering it more palatable, or do we understand that salt plays a most important part in assimilation and nutrition?

"Salt is credited with materially increasing the number of red corpuscles in the blood and being instrumental in the upbuilding of the weight and strength of the body. If this be so, it tells us that though we may with no dire results occasionally omit the modicum of salt from the mash prepared for the adult birds, the omission as regards the growing pullets and cockerels may be more serious.

"It is possible, however, to give salt in excess; if made a regular addition to the mash, one-fourth pound to a hundred weight of mash is ample for health and nutrition.

"Salt assists digestion by furnishing chlorine for the hydrochloric acid necessary to the gastric juice.

"*Sulphate of Magnesia* (Epsom Salts)—The one magnesia salt, the container for which in the poultryman's medicine closet should never be permitted to remain empty.

"Allow me to suggest that if you wish to secure brilliiancy of finish and increased whiteness in your next application of whitewash, to every ten gallons of wash add two pounds of Epsom salts dissolved in hot water.

"Epsom salts are well known as a safe, active cathartic, operating with little pain and nausea. They are more acceptable to the stomach than most saline cathartics and are retained when others are rejected. Particularly desirable as a laxative and cathartic in treating poultry, because it may be dissolved in hot water and the solution used to moisten the mash, thus insuring a fairly even distribution among the flock and yet avoiding the labor and saving the time for individual dosing.

"The dose should be from half to an eighth of a teaspoonful of the salt for each fowl, depending upon whether an active thorough purge is indicated or only a mild laxative action. And it is as the latter, administered periodically to all 'shut-in' flocks, that I desire to urge the employment of Epsom salts. Where but one or two or a limited number of birds give indication of an acute disease of intestinal character, as diarrhea, congestion or inflammation of liver, enteritis or limber neck, and an active, speedy cathartic is needed to thoroughly evacuate the bowels, in preference to salts, I would recommend a teaspoonful of castor oil poured down the throat of the individual afflicted bird; however, as such an active purging is apt to be followed by constipation, it will be well for several days following to mix a small laxative dose of salts in the mash.

"Birds on free range, during the green-growing months of the year, require no laxative drugs nor, for that matter, rarely any other dope. Animals in their natural habitat make no mistakes of diagnosis and in the open readily discover the medicine they require.

"During the shut-in period, and under the artificial environment that many flocks must live in from incubator to oven, they are dependent upon us for the service they are barred from performing for themselves. As many and possibly more eggs can be produced from housed and penned poultry, but on the other hand you increase their susceptibility to many disorders to which they would be entirely immune on free range and enhance the practical value of suggestions here offered.

"Within a month from the time of confining your birds to the laying house and scratching shed, I would recommend that for every six birds in your flock you dissolve a teaspoonful of Epsom salts in hot water and with the solution moisten the morning mash every fourteenth day during the entire shut-in period. Whether the droppings appear normal in color, consistency and quality need not be considered for the gentle laxative dose advised can do no harm to apparently healthy birds. The fact of the case is, that whereas we at once recognize abnormal conditions of color and consistency in the droppings and from other indications are able to detect the individual responsible and isolate her for special treatment, a condition of constipation in the flocks can often continue for some time without notice.

"This condition is particularly menacing as spring approaches, not because of the coming spring but because of the culminative effect of a winter of heavy feeding, limited exercise and possibly an insufficient supply of succulent greens. Spring calls loudly for bodily cleaning as well as house-cleaning and the whole process of the former activity centers around elimination. The winter's accumulation must be cleaned out, the liver made active and the blood revivified, and no artificial remedial agents will do better work to give quicker results than laxative, alternating doses of Epsom salts and flowers of sulphur in the mash with due regard to a judicious, gradual change to a lighter ration.

"If you deem the bi-monthly dose of salts during the winter months unnecessary, I urge strongly that in the early spring you resort to it bi-weekly for a month and the days that you do not use the salts incorporate a tablespoonful of flowers of sulphur in each quart of mash. It is not only safe, sane and timely treatment, but largely preventive of many summer ills.

Disinfectants

"Cleanliness and the periodical use of a good disinfectant are our best safeguards against disease and vermin. But the too common idea or conceit that the more we can pollute the air of our chicken houses with ill-smelling disinfectants, the more sanitary we make them, is an unfortunate and costly conclusion. A thorough cleaning up should precede the use of a disinfectant, and after cleanliness must become habitual for effective prevention. Once free from disease germs and parasites, we can depend upon whitewash and sunshine as our best and sweetest disinfectants if we are willing to lay on the one and let in the other.

"Another common mistake is failure to recognize that there is a vital difference between a disinfectant and a deodorizer. A deodorizer does not kill the disease germs, but simply substitutes one odor for another, and not infrequently gives us a sense of false security.

"Among products in general or occasional use as disinfectants may be mentioned carbolic acid, lime, sulphur, zinc, permanganate of potash, kerosene, benzine, naphtha, formaldehyde, turpentine and numerous petroleum and coal tar compounds sold under sundry trade names. All of these substances and products have their proper uses and distinctive values, and whereas without exception they are capable of destroying insect life when brought into direct contact with it, are not all true germicides, and some of them are far from being safe disinfecting agents for the poultryman because of their poisonous qualities and inflammable nature.

"*Coal or Gas Tar*—This prior to 1836 was considered only as waste and a refuse embarrassing to get rid of by gas and coke manufacturers. In that year, however, a chemist by the name of Runge gave the world a product from this waste material, which he named carbolic acid, and in no succeeding year have the wizards of commercial chemistry failed to give to the arts, industry and medicine new and wondrous products from this same source.

"*Carbolic Acid* is a phenol, hence is sometimes called 'phenol,' it is not, however, a true acid, but is more nearly related to the alcohols. As first obtained from the tar it is a reddish-brown oily liquid and consists of phenols, cresols and hydro-carbons in varying proportions. This is the commercial impure or crude carbolic acid and is the product I desire to recommend to poultrymen as equally efficient as a disinfectant as the pure carbolic acid, less dangerous in use and many times cheaper.

"Pure carbolic acid is obtained by repeated distillation of the 'crude' until deprived of all the cresol content, and pure cresol should contain no phenol or carbolic acid, but the commercial or crude forms of each have many constituents in common and serve equally well the same purpose as disinfectants and antiseptics. In fact, much of the commercial cresole is identical with crude carbolic acid.

"The selling price of the crude carbolic acid varies greatly acording to its guaranteed phenol content, the strength generally carried by retail druggists is from 20 to 25 per cent and the selling price about 25 cents a quart.

"Pure carbolic acid in liquid form, applied undiluted to the skin, causes a sharp pain, followed by numbness and a whitening of the cuticle. In contact with the mucous membrane, its action is the same. Given internally or applied externally in excess, it is a most fatal, rapid acting poison.

"The 'crude' has the same qualities, though of course to a lesser degree, and hence is not a safe internal remedy and its use of the fowl undiluted or in strong solution is not without danger. Its most important function as a therapeutic and sanative agent is its destructive influence of the lower grades of organic life, both animal and vegetable.

"Chlorine, fromine and permanganate of potash are more powerful than carbolic acid in disguising the odors of putrefaction, but the action of the acid is upon the cause and not the effect. Offensive animal matter in the presence of carbolic acid ceases to smell because it ceases to putrefy; the organisms of decay are destroyed, whereas the former drugs must be continues. Hence in so far as 'prevention is better than a cure,' carbolic acid and its combinations take first rank as disinfectants.

"As crude carbolic acid and commercial cresol are only slightly soluble in water, it is essential that one should know available and economical solvents or vehicles for its dilution and use. One of these in general use is common coal oil or kerosene; one pint of crude carbolic acid dissolved in one gallon of kerosene and used as a spray is a most effective mixture for the elimination of red mites, but it is too powerful a combination and too corrosive in its action to use on your birds, young or old, and even the strong fumes from the recent application to roosts and nests is far from beneficial. I do not consider kerosene a dilutant, but an accelerator used as a solvent for carbolic acid.

"Although carbolic acid does not readily mix with water, by the addition of potash or resin soap it will unite with water in all proportions, forming a milky emulsion.

"Not necessarily 'more uniform' in the 'making,' for it is by no means a difficult or complicated operation, but different lots of crude carbolic or cresol may and do vary greatly in strength and constituents, hence your finished home product will not always be a duplicate of the former 'batch.' But, after all, with a disinfectant for external use only, slight variations are no material handicap, and if you desire to make your own carbolic soap here's the how:

"Procure a pound tin of concentrated lye, 3 quarts of raw linseed oil and 2 gallons of crude carbolic acid. Dissolve the lye in a small quantity water, give it time to dissolve so as to use as little water as possible, and while you are waiting hunt up a five-gallon stone crock with a wide mouth and whittle out a stirring paddle. Pour the oil in the crock and very slowly add the lye solution, stirring constantly. Keep on stirring until you have a smooth liquid soap; then gradually add the acid, keeping your paddle on the move until the resulting liquid is a clear dark brown. This will mix in any proportion with water. Two or three tablespoonfuls to a gallon of water is about the strength for use with sprayer or brush for general disinfecting purposes. In disinfecting brooders, incubators and utensils that have been exposed to infection of any germ disease, twice the above quantity of 'soap' should be used.

"*Carbolic Petroleums*—Next to its importance as a disinfectant in liquid form, carbolic acid in the form of ointment offers the poultryman the greatest utility. The official carbolic acid ointment of the drug store is open to two objections; it contains 5 per cent of the pure acid, and hence is most too strong for general poultry purposes and the cost prohibits its free use.

"A five-pound tin of carbonized ointment is not an excessive amount for the average poultryman to have on hand; you should be able to buy 5 pounds of petroleum (cosmoline) for half a dollar, for the lower grades, unbleached, is far better for your purpose than the so-called 'refined.' Liquify it in a kettle over a gentle heat and add very gradually 5 liquid ounces of crude carbolic acid, stirring constantly. Remove from fire and continue stirring until cold and again semi-solid. Assuming that your crude acid did not exceed the grade known as 25 per cent, you can use this ointment freely on or about your fowls with no ill results and with great benefit. It should clean up scaly-leg, kill off the depluming mite, rid the chick of head lice and, rubbed into the vent-fluff, put to rout the body lice of hen and cock. It is also of use in chicken-pox to clean up the scabs and ulcers. And should you have a hen torn by the male, applied to the lacerated surface after the wound has been cleaned will prove a satisfactory healing salve. Aside from its own intrinsic value, this ointment offers a most desirable 'base' for the application of other desired drugs in ointment form.

"I frequently note lard recommended for a base for home-made salves. It is not good advice, for lard is by no means always free from disease germs, but even when sweet and sterile when first used, exposed to the air absorbs oxygen and becomes rancid. And rancid lard not only irritates the skin but may exercise injurious reactions on substances with which it is mixed. Petroleum being a mineral grease instead of an animal fat, is free from this menace of rancidity, and when carbolized offers not only an ideal sanitary but also an antiseptic base for all ointments or salves in which there is no ingredient incompatible with carbolic acid.

"If your carbolized petroleum does not give entire satisfaction as an insecticide, if any form of parasite survives its contact, you can easily reinforce its potency as follows:

"Free from all lumps and reduce to the finest powder one-half an ounce of flowers of sulphur and work it thoroughly into four ounces of your carbolic ointment.

"You can call this your 'sulpho-carbolate salve,' and I am very sure you will find it superior in results to the highly extolled sulpho-carbolate of zinc as a dressing for ulcerated tissue and membrane, and far easier to keep 'on hand' and apply.

Petroleum

"For many years now, except as an unknown constituent of certain patented 'oils' and liniments, crude petroleum is utilized only as a lubricant and in medicine has been superseded by paraffin oil and petroleum by-products of the distillation and refining of the crude petroleum in the production of gasoline and kerosene.

"You may be more familiar with petroleum as 'Cosmoline,' 'Vaseline,' or as 'Petroleum Jelly.' These are all one and the same product, but you usually have to pay something additional for the proprietory name and in buying it as "petrolatum' you are pretty sure of obtaining an article of

American manufacture, by far the best for your purpose. In buying it in any considerable quantity, if you can have choice of several grades, select a No. 2 or No. 3 in preference to a No. 1, for they will cost you less and are far richer in medicinal value. I prefer a rather dark petrolatum with a greenish tinge to one of a golden yellow color and translucent.

"Under the head of 'Carbolic Acid,' I gave working formulas for a carbolized petroleum and a sulpho-carbol ointment, and also referred to the superiority of petrolatum over lard as a base for all ointments and salves. A few words in relation to the proper method of making an ointment may not be amiss:

"In incorporating a drug in powder form with a fatty base, first see that the powder contains no lumps or grit and place it in the center of your stone slab or plate glass and rub it up with a very small portion of the base until all the powder is taken up and continue adding the base a little at a time, working each addition with your spatula or knife to uniform consistency.

"Such simple directions may seem superfluous, but it has been my observation that the amateur invariably reverses this process, by placing the entire amount of petrolatum or lard on the slab, sifts the powdered drug over it and attempts to work it into a smooth and uniform mass, and rarely succeeds. If the drug to be incorporated is in the form of a liquid or oil, it is best to melt the petrolatum with a gentle heat and slowly stir in the liquid or oil and continue stirring until the mass thickens as it cools. Alcoholic extracts or oils are extremely difficult to accurately distribute through a fatty mass by any other method, but you must avoid having the petrolatum base hot; use only sufficient heat to liquify it, otherwise the heat may dissipate volatile principles it is important to retain.

"The petrolatum product that demands the most extended notice, not for its intrinsic value to poultrymen, but because of its frequent recommendation for almost every ill of chickendom, is the illuminant—

Kerosene or Coal Oil

"This product is so well known, as to its appearance, cost, production and distribution, that I shall avoid further mention along these lines. I can confine my discussion to its actual and assumed value to poultrymen as an insecticide, germicide and remedial agent extraordinary. Frankly, the only use for which I can recommend kerosene in poultry practice, save as "midnight oil" for study and account keeping, is as an insecticide for the destruction of the Red Mite that breeds and hides in the cracks and crannies of our poultry houses.

"The sole superiority of kerosene over other insecticides for this purpose lies in its penetrating and flowing qualities; it reaches the lowest nooks and tiniest crevices better than the heavier coal tar products. But owing to this same volatile characteristic and rapid evaporation, it should be remembered that kerosene is short-lived in its action. The application of today may not answer for the needs of tomorrow. To destroy mites, larva and eggs of this pestiferous parasite, there must be actual contact with the kerosene, the odor or fumes are not sufficient. Hence, an oil can and brush are better instruments for distribution than a sprayer, but should you conclude that the latter is more convenient, it will be well to add to each quart of kerosene, two ounces of crude carbolic acid.

"I cannot endorse the oft repeated advice of kerosene as a cure for roup, colds, catarrh and bronchitis, either by means of dipping the fowl's head into a bucket of water covered with a film of oil, the internal administration from a teaspoon, or by floating it on their drinking water. All these kindred ailments are distinguished by a more or less inflamed and congested condition of the mucous membrane of the head, throat, nasal passages and bronchial tubes. To effect a cure, it is necessary not only to kill the germs, but also to heal and restore to normal condition the diseased membrane.

"Kerosene is described as a 'powerful and dangerous irritant' to the cuticle and mucous membrane. How then can it also exert a soothing and healing action on said membrane? It is true that as a home remedy kerosene is sometimes successfully used as an external application to the throat and chest to allay internal inflammation and congestion, but in such cases it acts as a 'counter-irritant,' and it is only as a counter-irritant kerosene can be of service. But so long as we take any pride or satisfaction in our chickens wearing feathers, efficient counter-irritants are barred from poultry practice. Poultry editors probably have more inquiries regarding 'the loss of feathers than any other one form of 'trouble'; the answer may be vermin, depluming mites, favus, or feather-pulling, but the writer wonders if the too free resort to kerosene may not often be the correct explanation? I recall reading an inquiry for a remedy for the Texas flea, and the reply was as follows: 'Apply kerosene, full strength, freely to head of fowl; the oil won't hurt the fowl, but will kill the fleas.' But if the advice was followed, it's a safe bet that one Texas poultryman could exhibit a flock of bald headed chickens. And it must not be overlooked that any application powerful enough to cause the feathers to drop out must further irritate a cuticle already sensitive and sore from the parasite's ravages.

"Reverting to the kerosene treatment for roup, etc., I presume the theory is that it kills the germs of the disease; perhaps it does; but there are many drugs that will kill germs but only at the expense of a shock to the nervous system of the fowl or injury to the cuticle or mucous membrane that will take up much of the fowl's vitality to repair.

"I fear we are all a little daffy about germs anyway. We are told that there are both good and bad germs, but even the bad ones have too much self-respect to come when they have not been invited. What the industry needs is not more germicides, but less germ-allures. It's too late to go gunning for the germ that is in the sick chicken; its mission was accomplished ere we noted the symptoms. Wage vigorous war on the germs without, and if the good germs can't lick the bad ones within, it is because you haven't cultivated them or given them a chance to keep their powder dry.

Spirits or Oil of Turpentine

"Obtained by the distillation of resins from sundry species of southern pine and fir wood, seem to have no legitimate place in a letter devoted to petroleum products, but I hope to show that there is no inconsistency. In physical appearance, chemical composition and in their use and abuse as poultry remedies, there exists a close analogy between the spirits of turpentine and kerosene.

"The bulk of each is made up of the same volatile and inflammable hydro-carbons, and neither is soluble in water.

"Each when employed externally is readily absorbed by the unbroken skin, will quickly blister and destroy the plumage.

"Given internally are dangerous irritants to the mucous membrane, unduly stimulate the kidneys and in large doses cause purging and hemorhage of bowels.

"I am not questioning but what both turpentine and coal oil may occasionally give good results, seemingly, but I do claim they are unnecessarily severe and cruel remedies, and that poultrymen can very well dispense with their services, as the good they can accomplish can be secured by other milder agents that carry no menace.

"I have known turpentine to be advised as an injection into the vent for bowel trouble and even administered to baby chicks in the same manner as a cure and preventive for this same 'white diarrhoea.' Did you, in your young and savage days, ever administer turpentine to the same part of a stray dog's anatomy? If so, you will recall that said dog needed all outdoors to express his opinion of turpentine so administered.

"I wonder by what peculiar process of reasoning those who advocate an enema of turpentine or any other drug as a means to make immune the baby or growing chicks from white diarrhoea, cholera and roup, refer to the treatment as 'inoculation'?

"It is very true that oil or spirits of turpentine has certain and accepted values in therapeutics. It is an excellent vermifuge, followed by castor oil, particularly for the expulsion of the tapeworm; it is frequently employed in low types of fever, as in certain stages of typhoid, and is occasionally used as an enema in obstinate constipation and in the accumulation of gas in the bowels. By this seeming endorsement of its use with poultry, it must be noted that turpentine so employed is always in the form of an emulsion or its irritating qualities modified by bland oils or mucilagenous mixtures. And such preparation is far from practical in poultry practice.

Acids

"Of the more than 500 acids recognized by chemistry and pharmacy, but very few are of utility to poultrymen, save as exhibited in their 'salts' or as one or more of the constituents of the natural or artificial 'ration gathered by or provided for the birds.

"And right here I want to go on record that, although I write of drugs, I protest against continual or unnecessary 'drugging.' If your flock is well-bred, well-fed, well-watered, well-housed—given room, range and kindly treatment—you should have but rare occasion for any drug or remedy.

"'Prevention is better than cure,' but mark this—intelligent and worth-while prevention lies in the observance of the preceding paragraph and not in the drugging or in the inoculation of perfectly well and normal chicks or chickens.

"Drugs are only a necessary evil, as drugs; it is far better for the vitality and productiveness of your flock that they obtain the minerals, salts and acids their economy demands from Nature's laboratory in field, forest and stream, than from the druggist's shelves or proprietary preparations.

"And when 'shut-in,' keep in mind that not only must the grain, grit, shell, meat and greens be ample in quantity, good in quality, but of sufficient *variety* to furnish *all* the elements required to maintain health and vigor. Although the poultryman in his work and attendance has need of but few of the many acids, it is wise for him to know something of those with which we are all more or less familiar and those most frequently referred to in the poultry press.

'*Boric Acid.*—Fifteen grains dissolved in an ounce of water makes an excellent wash for cleaning out the mouth and nostrils of the fowl afflicted with catarrhal accumulations. I referred to this acid under Soda, and stated that its therapeutic value was identical with Borax.

"*Salisylic Acid.*—There exists a group of organic or vegetable acids that doubtless at times the fowl's organism demands a modicum of, that we can best administer by giving them the run of the orchard and garden or throwing them waste from our tables. It would be absurd for me to recommend the feeding of fruits at regular intervals, and too often offering of them to the penned birds would be unwise, but I am satisfied that an occasional acid fruit or berry is not only relished, but craved by the confined birds.

"It is easily demonstrated that fallen fruit and reachable berries form a portion of their ration on free range.

"*Phosphoric Acid.*—Bone meal and granulated bone, add libitum and freshly ground, untainted green bone, in moderation, afford the fowl this necessary product to growth and upkeep.

"*Wood Tar.*—Also obtained in the destructive distillation above referred to, is a semi-fluid dark brown or black substance, strong, pungent odor and sharp taste, officially known as Pix Liquidate. It has considerable medicinal value, being valuable as a dressing in scaly skin diseases and much employed in combination with other oils and syrups as an expectorant in sub-acute and chronic bronchitis.

"Visiting a poultryman friend one day last summer, in the course of our talk, he remarked: 'I was much interested in what you wrote in the A. P. J. about the use and abuse of Permanganate of Potash. I won't say but what you and Dr. Woods are right, but if you are right, there are many, many others that are wrong. You know I have a healthy bunch of birds, but during the late fall rains a few invariably 'catch cold' and I have never given them anything but Permanganate; give them a house to themselves and dissolve the P. P. in their drinking water until it is rich wine color. It cures 'em. Now the question is, if you have me throw away this potash, what can you offer me to take its place?'

"My reply was that I was inclined to think his naturally healthy birds, isolated and confined from the inclement weather in a dry, roomy, sunshiny (when the sun did shine), and well ventilated house, would have quickly recovered from their colds without any medicated water, but if in the future, to ease his mind of the feeling that he ought to give them something and cater to his desire to give that something in the water to save the labor of individual treatment, I would recommend that he make and give them 'tar water' on alternate days, after a purgative dose of Epsom salts in their mash the first day of isolation and confinement.

"And in case any care to try the substitution, I will state that tar water is made by adding one pint of tar to four pints of water and shaking vigorously during twenty-four hours. Pour off the liquid and strain or filter. For poultry use, to each pint of the tar water you may add four pints of pure water. Its medicinal properties are similar to turpentine, but very much irritant. It also acts as a stimulant and diuretic. For acute and even chronic catarrhal conditions it is an excellent home poultry remedy. Water takes up from the tar, in addition to other constituents, a small portion of creosote and Acetic Acid.

"*Lactic Acid.*—An organic acid usually obtained by subjecting milk or grape sugar to lactic fermentation. It is formed whenever sugar in solution is placed in contact with an alkaline or earthly carbonate in presence of a special ferment, as, for example, the casein of milk or cheese; hence it is evolved in the souring of milk, so in the feeding of sour milk, curd or buttermilk to the flock, the poultryman is availing himself of the cheapest, most convenient and desirable form in which to administer lactic acid.

"True it is that certain manufacturing chemists offer in tablet form cultures of imported bacterium bulgaricum, which, dissolved in sweet milk, produces a milk much higher in acidity than our domestic lactic acid bacteria, but the greater acidity is more than counterbalanced by the increased cost, prohibitive of profit if you are employing soured milk for its nutritive as well as remedial value.

"For two or three years past the feeding of milk, sweet, sour, whey, curd and buttermilk, has occupied much space in the poultry press and many extravagant claims have been filed to the effect that, in addition to taking the place of meat in the ration, it is a cure and preventive of the greatly dreaded and much advertised White Diarrhoea in baby chicks.

"It is in the interest of the great poultry industry that the individual poultryman ceases to be continually on the lookout for the appearance of these fatal germ diseases, but constantly and intelligently on the look-in for conditions of housing, sanitation and improper diet that are responsible for the catarrhal colds of the adult birds and the abnormal droppings of the baby chicks that he mistakenly diagnoses as Roup or White Diarrhoea.

"The State Experimental Stations are trying for, and doubtless in good time will secure a 'strangle-hold' on these obnoxious germs, and when they do, we will all doubtless be invited to the obsequies. And finally, brethren, in bringing this article to a close, just a word of caution in the feeding of sour milk:

"Fermenting sour milk is capable of forming an intoxicating drink; keep your receptacles clean and don't use tomorrow what was left over from today. And if you are of those who keep the pink tea of Permanganate before the flock, cut it out the days you feed sour milk, for lactic acid of sour milk produces in contact with the Permanganate of Potash, acetic aldehyde, a powerful and poisonous alcohol.

Oils

"For practical purposes of care and treatment of poultry, I would divide the oils into simply two classes: Those valuable for external use only, and those advisable for internal administration. And simply as oils, I find it unnecessary to comment on but few in each class. The essential oils are so denominated because they possess in a concentrated state the properties of the plants from which they are obtained. Oils are not only insoluble in water but too concentrated and too pungent for distribution in the mash.

Alcoholic tinctures of the plants of virulency and the plant itself, if innocuous, are more practical vehicles for medicating our fowls than the expressed or distilled oils.

"This is in accord with a principle that if I can thoroughly fix in your mind and establish in your practice, I will have done you more real service than in all my other 'recommendations,' namely, when in your judgment your birds stand in need of certain elements, mineral or vegetable or animal, acid or alkaline, laxative or astringent, and you can afford them the indicated medication through careful selection in the rations of greens, grain and mash, you should do so in preference to resorting to laboratory products.

"As I have already intimated, not having a great deal to offer on the subject of oils, I shall add a few lines in regard to the use and value of mustard seed and flaxseed meals. This, however, is far from foreign to a chapter on oils, for the fixed or fatty oils of vegetable origin are furnished us almost exclusively by the fruit and mainly by the seed, and the employment of the meals or ground mustard and flaxseed, instead of the expressed oils, follows the principle above outlined.

"Oils for external use:

"Cotton seed oil, not necessarily for 'external use only,' as you may now have it on your table labeled 'olive oil,' but placed under this classification here, as I desire to recommend it as an economical, bland, innocuous base and dilutant for more active remedial agents.

"Dissolve two ounces of gum camphor in eight ounces of cotton seed oil for the oft recommended camphorated oil; sprayed into the nasal cavities and throat, it is an excellent remedy for catarrhal conditions. Good as a dressing for frozen combs and wattles, and will clean up scaly legs unless treatment has been too long delayed.

"Oils for internal administration:

"Leaving out of question food values, and referring only to medicinal use, under the above classification I can restrict my comments to one oil that in my opinion deserves to be designated as 'first aid' in acute disorders, namely,

"*Oleum ricini or castor oil*: Obtained from the seeds of Ricinus comhunis, native of the East Indies and northern Africa, but cultivated throughout the Middle and Western states, both for oil production and for its ornamental value. The action of the oil as a cathartic is mild, speedy and thorough; stimulates the liver, allays irritation and inflammation of the intestines and lubricates the tissues.

"Intestinal disorders, save in the instance of that rare disease, chicken cholera, are individual ailments and not flock infection, hence should command individual treatment:—a teaspoonful of castor oil poured down the throat of the ailing bird is preferable and far more certain in its action than a purgative given through the medium of the mash or water. Diseases of the liver, limber-neck, diarrhoea, indigestion and enteritis, are all due, in a great measure, to the absorption of poisons in the intestines arising from indurated faeces and acrid accumulations. So in treating these 'ills' it follows that the 'first aid' should be a thorough examination of the bowels; in many cases no further medication is necessary.

"In administering castor oil, slightly warm the oil or have the spoon hot and the oil will not cling to the spoon or the bird's eosophagus. And this is not a bad tip for family use.

"It is of little moment if you use none of my given formulas and soon forget, as you doubtless will, what I have offered regarding the several drugs treated, if you will but approve and adopt certain rules I have endeavored to emphasize, and a few of which I desire to repeat in closing:

"Shun poisonous drugs and compounds and avoid cruel treatments.

"Know what you are giving or using, and why.

"Remember that no drug or remedy can give you good results without the co-operation of care and cleanliness.

"Keep in mind that fresh air, sunshine and whitewash can keep down your outlay for disinfectants and germicides.

"Remember that healthy, well-fed fowls require no stimulants and that spicy condiments are only valuable in adding an appetizing flavor to a mash that's grown monotonous.

"Remember that fresh, clean and abundant water is preferred by your birds to pink tea or doped drink and in nine cases out of ten is better medicine.

"Forget not that first aid to sickly bird or ailing flock means a general and thorough cleaning up and down and food inspection.

"And finally, brethren, when 'doctoring' your fowls, if in doubt, give them or use on or about them nothing you would hesitate to take or use on yourself or in your family for like ills and injuries.

"This I call the poultry practitioner's Golden Rule."

CHART OF DISEASES AND SYMPTOMS

Simple diagnosis of the most common poultry diseases:

Bronchitis:—Difficult breathing, wheezing, rattling or bubbling sound. Mucous in mouth or throat.

Bumble Foot:—Swelling about the toes and feet. Often lameness.

Break Down:—Abdomen large and baggy. Crowded with fat and hangs down.

Black Head (Turkeys):—Head dark. Victim mopes, loss of appetite, wings dropped. Diarrhoea. There are no special external symptoms until the advanced stages of the disease. If the birds are losing in weight, look on them as suspicious cases.

Colds:—Watery discharge from eyes and nostrils.

Catarrh:—Mucous in nostrils. Offensive odor about the head.

Chicken Pox:—Comb and face covered with warts, sores and scabs.

Croup:—Difficulty in breathing. Coughing accompanied by wheezing or rattling. In severe cases birds become sleepy. Refuse to eat. Wings droop. Temperature high.

Canker:—White cheesy patches on tongue, mouth or throat. Coughing and difficulty in breathing if canker is in the trachea.

Cholera:—Deep yellowish diarrhoea, finally changing to greenish. Feathers rough, head drawn down towards the body and wings droop. Sleepy appearance. Frequent discharges. Instant thirst.

Crop Bound:—The crop is enlarged and prominent, and seems filled with food.

Congestion of Lungs:—Difficult rapid breathing, sleepiness and indisposition to move. Comb dark.

Congestion of Brain:—Spasmodic and nervous. Head drawn back and loss of control of head and neck muscles. In acute stages they become more quiet.

Diarrhoea:—Their droppings, either whitish, yellowish, greenish or brownish, sometimes have an offensive odor.

Enteritis:—Severe form of diarrhoea. Bird is inactive and dumpish. Comb is first pale and limp and later becomes dark. Bird is sleepy and unwilling to walk. Distention of the abdomen.

Egg Bound:—Frequent visits to nests. Hen strains and appears to be in distress. Stands more or less erect.

Eversion of Oviduct:—The oviduct and a mass of red and bloody tissues projecting from the vent.

Gapes (Young Chicks):—Frequent gaping, coughing and sneezing. Dumpish, weak, and drooped wings. Eyes closed, mouth opened and tongue protruding.

Going Light:—Bird gradually grows thinner and becomes practically skin, bones and feathers. Comb pale and withered.

Internal Worms:—Evidence of indigestion. Comb is pale. Diarrhoea or constipation. Birds become thin and lifeless.

Inflammation of Crop:—Crop filled with liquid and gas. Contents sour. Bird is dull, loses its appetite and shows weakness.

Limber Neck:—Control of neck muscles is lost. Neck hangs limp so the head falls toward ground between the feet.

Leg Weakness:—Unsteady walk. Will sit while eating. Often unable to stand alone and constantly tumbling over.

Liver Disease:—Rough plumage, watery diarrhoea, brown or yellow, lack of appetite, sluggish, comb first purple, then dark, and finally black.

Peritonitis:—High fever, stupor, glaring or bright eyes, distended abdomen, frequent discharges from the vent, indisposed to move.

Ovarian or Oviduct:—Act as if broken down in back and a tendency to sit down. High fever. Glaring eye and sometimes have quivering motion. Seem in great distress. Rapid breathing. Discharge from vent resembling yolk of egg.

Pneumonia:—Attack sudden. High temperature. Rapid and difficult breathing. Coughing and many have a mucous dropping from the mouth and nostrils. Rough plumage. Drooping wings. Loss of appetite. Thirst and constipation.

Rheumatisms—Lameness or stiffness. Staggering motion and objection to moving. Sometimes swelling joints.

Roup:—Sticky, yellowish discharge from eyes and nostrils. Offensive odor about head. Eyes and face sometimes swollen. Loss of appetite. Results in general rundown appearance.

Sore Head:—Comb and face affected with sores, warts or scabs.

Scaly Leg:—Scales on legs, rough, raised and unsightly. In many cases scales have disappeared entirely.

Tuberculosis:—Emaciation. Pale comb and wattles. Weakness. Lameness. Ruffling of feathers and in last stages diarrhoea. Bright eye and ravenous appetite.

Vent Gleet:—Straining and frequent passages of excrement voided in small quantities. Vent swollen and irritated. Discharge collects on the skin. Sores and ulcers form. An offensive odor.

White Diarrhoea (Young Chicks):—Crop empty. Chicks sleepy and lifeless. Remain under hover or hen. Wings droop. No appetite. White discharge from vent. Shrill cry as if in pain. Short backed and big bellied.

Wry Neck:—Head drawn backwards. Nervous and spasmodic. No control of head or neck muscles.

QUESTIONS LESSON 27

POULTRY DISEASES, THEIR CAUSE, PREVENTION AND CURE

1. Why is the liver said to be a filter for the blood?
2. What, in your opinion, is the best treatment for roup?
3. What should be done in cases of tuberculosis or cholera?
4. What is the best remedy for canker?
5. How would you treat a case of severe crop bound?
6. What two symptoms would you look for in liver trouble? And name a treatment for liver trouble.
7. What is "Going Light"?
8. What is the difference between "limber neck" and wry neck"?
9. How would you detect vent gleet and what is the best treatment?
10. Name two simple drugs usually found among home remedies which are useful in treatment of poultry diseases, and give uses for each.

The Production and Handling of Market Eggs

By T. E. Quisenberry

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INTRODUCTION

With the rapid increase in the scarcity of beef and with our increasing population, poultry and eggs are certain to be in much greater demand. We are also certain that the price will gradually advance with the increasing demand and the scarcity of other meat products. In a single month recently 10,856,516 pounds of raw beef were imported by the United States from South America, Australia and other countries. In addition to this, in the same month 123,118 head of cattle were imported, to say nothing of the pork and mutton. There can be no doubt about the future of the poultry industry or the increased profit which can be made from the production of good quality eggs.

Notwithstanding these facts, it is also true that fifty million dollars' worth of eggs a year are placed before the "candle" and are found to be unfit for human food. This is our annual tribute to ignorance and carelessness. The loss of fifty million dollars annually in any other business would be considered a calamity and a national disgrace on our business judgment, yet we permit it to occur year in and year out without giving it really serious thought. It is a loss which is almost wholly preventable. It is probably well within the bounds of reason to say that the eggs which do succeed in passing the candle test would net their producers fifty million dollars a year more had they been laid by the right kind of hens, kept under proper conditions and marketed by modern methods. In other words, our farmers and poultry raisers are suffering an annual loss of approximately one hundred million dollars. Everyone of those eggs was good when laid. The carelessness and delay in handling has made the services of a host of wholesalers and their hirelings necessary; and yet the eggs when they reach the consumer fail to give satisfaction! Fully nine-tenths of this tremendous waste might easily be prevented if our egg producers and dealers would adopt the modern methods and practices which have proven successful in securing and maintaining high quality in market eggs. Such methods and practices are herein described.

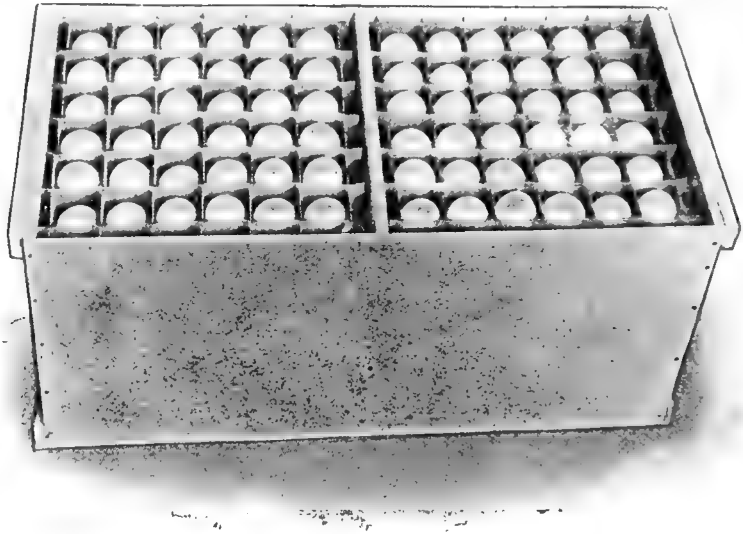
MARKET EGG SITUATION

Nine farmers out of every ten feel that they are not getting enough for their market eggs. Nine city dwellers out of every ten insist that they are required to pay too much for their table eggs, especially for eggs with a reasonable chance of standing close inspection with the shell off. Facts and figures seem to indicate that both the producer and consumer are right in their respective contentions.

Where, then does the trouble lie? A careful investigation shows that there are two classes of reasons for the wide margin between the price which the farmer receives and the price which the city consumer pays. The first class of reasons may be termed "Faults in production and handling on the farm." For this the farmer himself is largely responsible. The second may be classed as "Defects in the system of marketing." For these last it is impossible to definitely fix the responsibility. The present system of marketing has grown and continued to grow until it has become a headstrong giant, so powerful that it will never be curbed and brought into subjection until the people learn how to properly wield the sword of "co-operation" and "better marketing."

The consumption of eggs is already enormous, but it would more than double if we could establish more confidence in the market egg. The reason eggs are not called for more often in hotels, restaurants, cafes and such places is because the guest hasn't the confidence in the quality of the egg which would be served him. We feel that if the farmers and dealers were better informed about better methods of production and handling of eggs a higher quality article would be produced and a much higher grade egg marketed. We not only lose the value of the eggs themselves, but we also suffer a great financial loss because such a large percentage of the eggs which are offered for sale are unfit for food, and this necessitates the maintenance of a large army of inspectors by dealers in eggs and necessitates the payment of hundreds of thousands of dollars in salaries for these men each year. Most of this could be obviated and this vast sum saved for the producer and consumer if better methods of production and marketing were thoroughly undertsood and practiced.

At least ninety per cent of the farmers keep poultry upon their farms and most of them admit that their flocks yield them a reasonable profit, although any intelligent observer has but to spend a short time in the markets of our cities to learn that poor methods of preparing and marketing poultry and eggs prevent the producer from receiving much greater returns, than come to him at the present time. We know it to be a fact, admitted by all, that high-grade goods practically sell themselves, and if we are to put our poultry business upon a deservedly high plane we must give due consideration to the question of marketing. We must not only turn out a superior grade of goods, but it must be marketed in the most careful manner.



A HIGH GRADE PRODUCT SELLS ITSELF.

A case of clean fresh eggs in uniform size and color, produced by pure-bred poultry. From 90,000,000 to 100,000,000 dollars could be saved each year by American farmers and poultry raisers if all marketed eggs like these.

Mr. Farmer, join the band of good egg producers, if you are not already in that class. If every one will do that, market eggs will soon command a better price.

The consumer looks upon the average egg with suspicion. A better production and a more nearly uniform product would encourage much greater consumption. The sale of eggs unfit for food tends to lower the price and to keep it down.

COMPOSITION OF HEN EGGS

	Yolk (percentage)	White of egg (percentage)	Whole egg (percentage)
Water	46—52	80—88	70—76
Fat	30—35	Traces	9—14
Protein	14—16	10—13	10—15
Shell and shell membranes	......	......	9—12

It is seen that the whole egg usually contains over ten per cent of fat. Nearly all of this fat is in the yolk, and obviously the fowl must have a surplus of fat before the yolks can begin to develop. The eggs of ducks, geese, turkeys, guinea fowls, and other birds vary to some extent from the analysis noted above, but the differences are slight.

The detailed analysis of hens' eggs which follows is taken from Simon's text book of physiological chemistry:

Analysis of albumen (60.5 per cent of whole egg)

	Percentage
Calcium carbonate	90.00
Magnesium carbonate	Small amount
Calcium and magnesium phosphate	Small amounts
Water	1.00

Analysis of albumen (60.5 per cent of whole egg)

	Percentage
Water	80.00—86.68
Solids	13.32—20.00
Albumins	11.50—12.27
Extractives	0.38— 0.77
Glucose	0.10— 0.50
Fats and soaps	Traces
Mineral salts	0.30— 0.66
Lecithins and cholesterin	Traces

The mineral ash of the albumen has been found by Poleck and Weber to consist of:

Sodium ($Na^{2}O$)	23.56—32.93
Potassium ($K^{2}O$)	27.66—28.45
Calcium ($C^{a}O$)	1.74— 2.90
Magnesium ($M^{g}O$)	1.60— 3.17
Iron ($Fe^{2}O^{3}$)	0 44— 0.55
Chlorine (Cl)	23.84—28.56
Phosphoric acid ($P^{2}O^{5}$)	3.16— 4.83
Carbonic acid (CO^{2})	9.67—11.60
Sulphuric acid (SO^{3})	1.32— 2.63
Silicic acid ($S^{1}O^{2}$)	0.28— 0.49
Flourine (Fl)	Traces

Analysis of the yolk (29 per cent of whole egg)

According to Gautier we have the following:

	Percentage
Water	47.19—51.49
Solids	48.51—42.81
Fats (olein, palmitin and stearin)	21.30—22.84
Vitellin and other albumins	15.63—15.76
Lecithins. .	8.43—10:72
Cholesterin	0.44— 1.75
Cerebrin	0.30
Mineral Salts	3.33— 0.36
Coloring Matter	
Glucose	0.553

Poleck and Weber also give the following as the analysis of the mineral salts of the yolk:

	Percentage
Sodium (Na^2O)	5.12— 6.57
Potassium (K^2O)	8.05— 8.93
Calcium (CaO)	12.21—13.28
Magnesium (MgO)	2.07— 2.11
Iron (Fe^2O^3)	1.19— 1.45
Phosphoric acid, free (P^2O^5)	5.72
Phosphoric acid, combined	63.81—66.70
Silicic acid (S^1O^2)	0.55— 1.40
Chlorine	Traces

According to Simon, the shell is made up of an organic matrix of the nature of keratin. This matrix is largely impregnated with lime salts. The pigments of the shell are said to be derived from the common pigment of blood. The shell membranes are also composed largely of keratin, with a small amount of mineral salts, principally calcium phosphate. The white of the egg is supposed to consist of compartments which are divided by thin membranes and which contain the liquid albumen. These membranes are continuous with the chalazae and the shell membranes. The yolk consists largely of spherical cells, most of which are filled with fat.

HOW TO PRODUCE THE HIGHEST GRADE OF MARKET EGGS.

The Hens.

Since the source of the egg is the hen, and since we cannot hope to produce large uniform eggs in liberal quantities without strong, healthy, vigorous hens, it follows that the logical place to begin the improvements of our market eggs is in the breeding pen which is to produce our layers.

It is a serious and costly mistake to take eggs for hatching just as they come from the average farm flock. On every farm where there is a desire to increase the quality and number of market eggs per hen there should be a carefully selected breeding pen from which all eggs for hatching should be taken. This pen should be composed of mature hens selected for egg production, mated with a strong, vigorous male; if possible, the son of a high-producing hen. It has been found that more depends upon the breeding of the male, as to the number of eggs the offspring will produce, than upon the female. Yet much depends upon the females and great care should be used in selecting the females which are to go into the breeding pen. Some hens have a born tendency to lay and others a born tendency to put on fat. The latter should be culled out in establishing a laying strain.

In selecting hens for the breeding pen it is well to bear in mind that the winter layers are usually the best producers. The surest and best way to select the winter layers is by means of the trap-nest. Time spent in trap-nesting the farm flock during the winter months will prove a splendid investment. If, however, one does not care to use trap nests, there are certain indications of heavy laying qualities which should be looked for in selecting hens for the breeding pen. Hens which moult late in the fall have almost invariably been found to be heavy layers. Most high producers have good-sized combs for their variety. They also have broad, deep bodies. The back is broad and the ribs are well sprung, giving plenty of room for the egg organs and the digestive organs. A hen must have capacity to eat and digest a large amount of food if she is to lay a large number of eggs. Such hens are compactly built, not loose jointed, and their bodies are solid. They are wide between the pelvic bones, and also wide between the pelvic bones and the point of the breast bone. Select the pullets which mature quick and begin to lay earliest. Select the hens which are loose and flabby in the abdomen, and not baggy, hard and overly fat. Select the hens which go on the roost last at night and which come off first each morning. An early retirer and a late riser is not worth much in the poultry yards.

Great care should be exercised never to place hens in the breeding pen that have at any time suffered from any poultry disease. Hens that have ever been diseased should be plainly marked, so that they will never thereafter be used for breeding purposes. Some diseases are known to be directly transmissible to the progeny. As a result of others, there is an inherited weakness which renders the offspring more susceptible to the disease from which the parent has suffered, while still others merely weaken the constitution and render the bird unfit for breeding purposes.

USE PURE-BRED HENS

Do not keep mongrel hens and expect to make the largest profit, either from market poultry or market eggs. The highest priced eggs are those which are large and uniform in both size and color. Scrub hens do not lay eggs that are uniform in size and color. Pure-bred hens do. The average pure-bred hen, which has been carefully selected and bred for egg production, lays several dozen eggs a year more than does the average mongrel hen—and she lays them when eggs are high.

It is both a surprising and discouraging fact that there are more farmers who are still harboring mongrel poultry than there are farmers who have banished the scrub and have begun to raise one of the pure-bred varieties. Yet there is not a single reason why the farmer who is raising poultry, either for eggs or market, or for a combination of both, should keep mongrels or attempt to combine any two of the existing varieties. Any such attempt always results in the impairment of the good qualities which have required years of scientific mating and careful selection to produce. When two varieties are crossed, not only is the average size and number of eggs per hen reduced, but there is a great variation in the size and color, and a larger proportion of the eggs grade "seconds," thus bringing a lower price. The sooner our poultry raisers awake to this vitally important fact the sooner will they begin to make dollars where they now make dimes.

Just which variety of pure-bred poultry the farmer shall select it is not within the province of this bulletin to suggest. Repeated careful tests indicate that there is no "best" breed. More depends upon the strain—that is, upon careful selection and breeding, than upon the variety itself. The variety should be selected which suits best as to color, size and shape, and then carefully bred for quality and productiveness.

In selecting a variety for market egg production, the size of the egg and the number produced per year per hen are the two most important considerations. Almost as important as the total number of eggs which a hen lays during the year is the number which she lays during the winter months when eggs are highest in price. In this connection, the following table will be of interest. It shows the winter egg production, or the total number of eggs laid between November 15 and April 1, by the thirty hens of each of the varieties which were in the Second National Laying Contest. The table shows the total weight of the eggs laid by each variety, also the average weight per dozen of all the eggs laid by each variety. While it would be inaccurate to say that the winter-laying qualities of the various varieties of poultry and the average weight of the eggs laid by each variety are as indicated in this table, yet it may at least be taken as showing "which way the wind blows." One fact directly contrary to a belief commonly held by poultrymen is plainly shown—that is, small hens do not necessarily lay small eggs.

Winter egg production of the following varieties:

Record of Eggs Laid Between November 15, and April 1.

Number of hens	Variety	Average weight per hen in pounds	Total number eggs laid	Total weight of eggs in ounces	Average weight per doz. in ounces
30	Anconas	3.65	1477	3135.7	25.44
30	S. C. W. Leghorns	3.82	1934	3912.8	24.24
30	S. C. Br. Leghorns	3.32	1473	2816.6	22.92
30	R. C. W. Leghorns	3.56	1306	2670.6	24.48
30	Black Minorcas	5.36	1223	2776.8	27.24
30	S. C. Buff Leghorns	3.53	1066	2148.2	25.32
30	Silver Wyandottes	5.07	2088	4146.3	23.76
30	White Wyandottes	5.48	1847	3743.	24.24
30	Partridge Wyandottes	6.11	1078	2017.2	22.44
30	Buff Wyandottes	5.59	1590	3085.8	23.28
30	White Rocks	6 58	1080	2222.8	24.72
30	Barred Rocks	6.69	1465	2987.6	24.48
30	Buff Rocks	7.00	1608	3337.2	24.84
30	Patridge Rocks	6.22	983	1940.7	23.64
30	S. C. Reds	5.94	1545	3221.6	24.96
30	R. C. Reds	6.23	1423	3011.2	25.32
30	Black Langshans	7.10	1972	4258.5	25.92
30	Buff Orpingtons	6.53	1626	3258.5	24.
30	Black Orpingtons	6.65	1266	2588.3	24.48
30	White Orpingtons	6.38	1714	3478.8	24.36

Practically the same variations and results were shown by later egg-laying contests.

THE FEED IS IMPORTANT

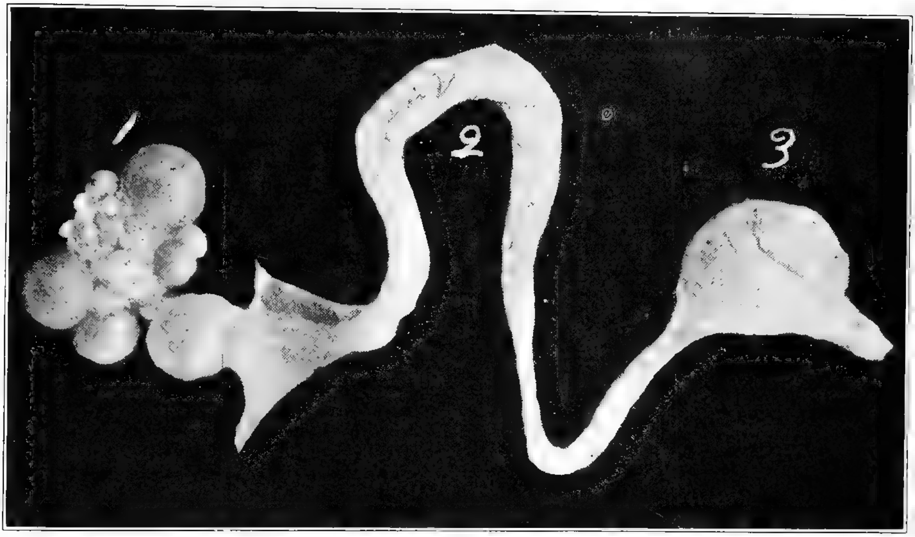
A fresh egg in winter is one of nature's choicest delicacies, and one which should be found on every breakfast table. The high price of winter eggs, however, makes them almost prohibitive in many homes. We offer a few simple suggestions to the end that a large proportion of your hens may produce a liberal number of eggs during the winter months.

See that they have the right kind of feed and plenty of it The following system of feeding has proven very successful in the production of eggs. In winter the scratch feed is composed of two-thirds coarsely cracked corn and one-third wheat. In the spring and fall they are given equal parts cracked corn and wheat. In summer they get 2 parts wheat and 1 part cracked corn. About a pint of this mixture is fed to each ten hens each morning, and about 1½ pints at night in a litter of straw. The straw should be from four inches to eight inches deep. Feed more heavily at night than in the morning. Keeping the hens busy is another of the very important essentials to winter eggs. In addition to the above scratch feed, a dry mash composed of nothing but ground oats is kept before them at all times in a feed hopper. If ground oats cannot be secured, a mixture of 1 part bran, 1 part corn meal and 1 part shorts will do. Sour milk or buttermilk is also kept before them at all times. Where the milk is not available about ten pounds of beef scraps should be mixed with each 100 pounds of the ground oats or dry mash mixture. Where flocks are kept confined they should be provided with good, sharp grit, oyster shell and charcoal. Provide plenty of fresh water. In cold weather it is a good plan to water three times a day.

Some sort of green feed is essential. For this purpose nothing is better than sprouted oats. Good oat sprouters can be purchased from most poultry supply stores or one can be easily constructed at home. Neither light nor artificial heat is required to sprout oats, provided they are kept in a cellar or basement where the temperature does not go much below sixty degrees. First soak the oats twenty-four hours in a bucket of water, then drain off the water and turn out the oats in a shallow box or tray. Repeat daily. By the end of a week you will have seven trays of sprouting oats, when the first tray should be ready to feed. The trays of sprouting oats should have porous bottoms, made of galvanized iron with holes punched in them for drainage. The oats should be sprinkled daily. Thus you can provide for a continual succession of green feed throughout the winter.

Hens are largely creatures of habit, and regularity in feeding and care is important. Follow the above suggestions carefully and we feel sure you will be rewarded with a liberal supply of precious "hen-fruit."

The hen is not an air plant. She is a factory for the converting of raw material into one of the most delicate and valuable of human foods. If any factory is to turn out a maximum amount of a high quality product it must have an abundance of the right kind of raw material. So must the hen. Wheat is the best single grain feed for laying hens. When it is necessary to feed any kind of grain feed, wheat should form the major part of the ration. If wheat is not produced on the place, it will pay to sell corn and buy wheat, even though the price of the latter is relatively higher. Study the flock. Guard against both over-feeding and underfeeding. The overfat hen will not lay, neither will the half-starved hen.



Photograph of the egg organs of a hen straightened out to show the sections where different parts of the egg are made. 1 is the ovary where the yolk is made. 2 is the part of the oviduct where the white is made. 3 is part of the oviduct where the shell is made. It will be seen by examining the above illustration that the egg is made by piece work. The yolk is made first, then the white or albumen is placed around it, then the shell is placed around this, which completes the egg. If a hen is fed a ration which would make 100 yolks, 25 whites, and 100 shells, 25 eggs would be all the hen could make. Hens fed this kind of ration are poor producers regardless of their breeding. Hens fed a balanced ration, one that would make 100 yolks, 100 whites, and 100 shells, produce all the eggs it is possible for them to produce.

INFLUENCE OF RATION ON WEIGHT OF EGGS

There is often easily observable and sometimes pronounced differences in the strength, growth and vitality of chicks hatched from the same hen's eggs. In order to determine if possible whether the ration, and variation in weight of white or yolk had anything to do with this, the West Virginia Experiment Stations made some experiments and these are their conclusions:

The preceding tables show that the eggs laid by individual hens vary considerably in respect to their weight, the weight of the yolk, and the percent of the total egg weight that is yolk. To what extent these variations are due to excitement, digestive disturbances, fluctuations in temperature, or other causes is impossible to determine from the available data, and should be made the subject of further inquiry.

(1). The heavier the egg, the heavier the yolk.

(2). The heavier the egg, the smaller is the total percentage of the egg that is yolk.

(3). When eggs are laid in cycles the first egg in the cycle is usually the heaviest, the other eggs decreasing in weight according to their position in the cycle.

(4). The weight of the yolk usually decreases according to the position of the egg in the cycle.

(5). In general, the first egg in all cycles has a lower percentage of total egg that is yolk than has any of the other eggs.

(6). The eggs laid by individual hens not only vary widely in regard to their average weight and the average weight of their yolks, but the average percentage of the total egg that is yolk also varies widely.

(7). The result indicates that the presence of a considerable amount of animal protein in the ration for laying hens tends to weaken the vitelline membrane.

(8). The eggs and yolks from the wheat fed fowls averaged somewhat heavier than the eggs and yolks from the corn fed fowls.

(9). With the smaller amount of scrap in the ration one year the percentage of the total egg that was yolk was greater in the eggs from the corn fed fowls; but in the following year with a larger amount of scrap, the percentage was smaller than in the eggs from the wheat fed fowls.

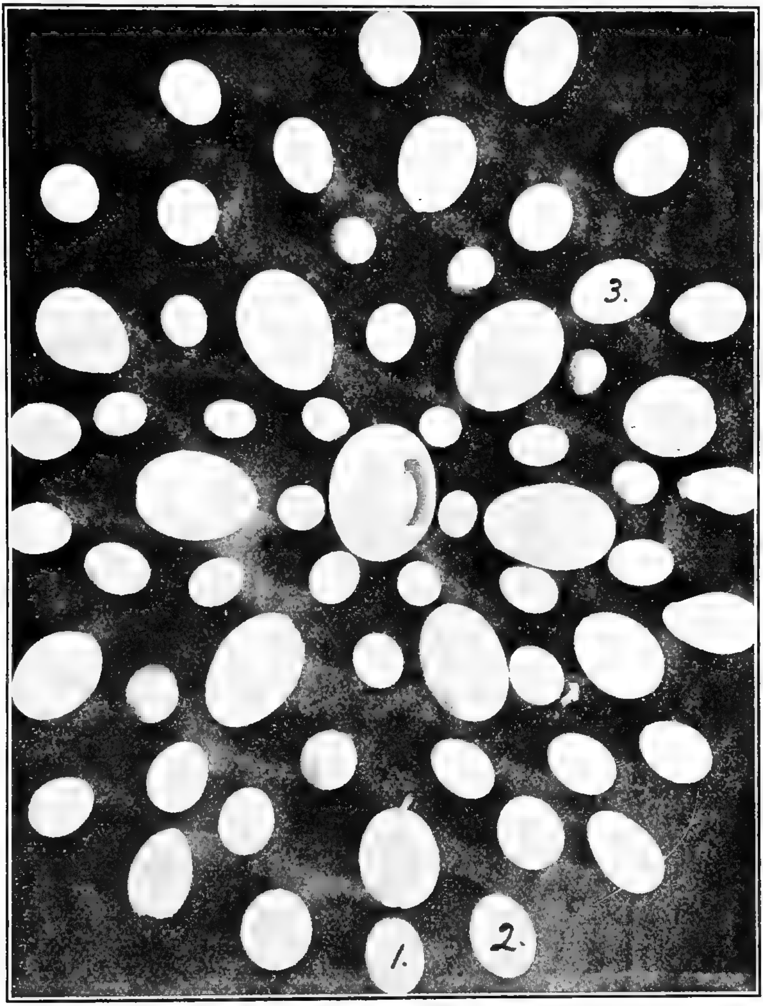
(10). During the second year of the test, the weight of eggs and yolk and the percentage of the total egg that was yolk, were greater than during the first year.

THE NECESSITY OF PROPER HOUSING

Given carefully selected, pure-bred hens, the next essential to the profitable production of quality eggs is the right kind of a poultry house. One winter egg is worth from four to five summer eggs, and it is useless to expect many winter eggs unless the hens are properly housed. It is not necessary to build an expensive poultry house in order to have a good one. It should be built facing the south on high, well-drained ground. The roof, north side and two ends should be both water-tight and wind-tight. On the south side provision should be made for admitting an abundance of sunshine and plenty of pure air without draughts. Not less than three square feet of floor space should be allowed for each hen which the house is to contain. Much of the loss and many of the ills and dissappointments met with in poultry raising can be traced directly to nonsensically designed, poorly constructed, badly ventilated, inconveniently arranged and improperly located poultry houses. A poultry house need not be elaborate or expensive. It should be designed with a view of economy, simplicty, comfortableness, convenience, dryness, cheerfulness, sanitation, and of having the right amount of ventilation and sunshine. (Write for the plans and description of our fool-proof poultry house.)

BREEDING TO IMPROVE THE QUALITY OF EGGS

To anyone who has given any study to the egg situation it is very evident that the farmer and producer of eggs can make more money and make it more easily by attempting to improve the quality of the eggs than they can by attempting to increase the number of eggs laid by a flock of hens. There is no doubt but that we should study methods of increasing egg production, but comparing the two ways by which we can increase a net profit from our hens, there is no doubt but that we can make more rapid gain with less trouble and make a great deal bigger porfit in the end by striving to improve the quality of eggs. It is easier, as a rule, to get hens to lay eggs of a more uniform color and a little better shape and larger eggs than it is to materially increase the number. By selection year after year it is a comparatively easy matter to decidely change the color, shape and size of eggs that hens lay.



By careful selection and breeding, a farmer or poultry raiser may increase the size of the eggs and can also improve the uniformity of the color and shape of eggs. Nos. 1, 2 and 3 represent perfect eggs of normal size.

In almost any market in this country the determining factors which largely regulate the price in nearly every case are size and quality, yet it is often the case that eggs which are medium in size and a uniform color, either white or brown, will bring higher prices per dozen than will larger eggs of mixed colors. There are a large number of firms and egg-packing establishments in this and other states which are buying eggs of all colors and sizes, and by systematically grading them these people are making a splendid profit in their business. The farmer should learn to grade his own eggs and thus save much of the tremendous amount of money which is annually paid by egg-packing establishments to graders, candlers, etc.

Why is it that the better class of trade in our cities are willing to pay the difference in price for clean eggs of a uniform size and color? It is largely because these eggs are more attractive looking, as if they were laid by pure-bred poultry, and are uniform in color and shape. When a buyer sees a brown egg and a white egg, a long egg and a round egg, a large egg and a small egg, a clean egg and a dirty egg, all mixed in the same basket or case, he immediately gets the impression that these eggs are from no place in particular and from everywhere in general. Immediately doubt is cast upon them, and when people begin to doubt the character of an egg it is "all up" with that egg. The consumers buy eggs largely upon appearances. If they see that the eggs are clean, reasonably uniform in size and color, that they are all dead white or pure brown, they immediately have faith in the egg and presume that they were produced by a flock of pure-bred poultry that was given good care and properly fed and housed. A basket of pure brown eggs or a plate of dead white eggs look very attractive when separated, but mix them together and they do not present such an attractive appearance.

There is no doubt but that the poultry people are fifty years behind the times. California and the western states would never be noted for the wonderful fruit which they produce if the fruit growers of those states should sell all of their best varieties of fruit mixed in the same case with the culls. In fact, if shipped in that condition, they could not receive enough for a car of their fruit when it reached one of the eastern states to pay the freight or the express upon the car. It would not bring much upon any market, but when they are graded and carefully packed they bring the highest prices and make the fruit business in California very profitable. The same principles will apply to the poultry business and to the marketing of eggs. No matter what the product may be, when you mix good quality with poor quality the poor product is certain to bring down the price of the good more than the good will bring up the price of the poor. When you place medium-sized eggs with large eggs it makes the medium-sized look very small, but when you place a full case of medium-sized eggs before a buyer for his inspection, and all are of one color, he looks upon them as being a very good case of eggs.

How are we to breed so that we may improve the quality of the eggs? We know it to be a fact that a hen lays essentially the same color and shape egg year in and year out. Of course we know that the first eggs of a pullet are small and will gradually increase in size until they reach their normal state. We also know that in varieties of poultry which lay brown eggs the last eggs of a "litter" will be somewhat lighter in color than will the first eggs laid, so we can see that the shape and color of an egg changes slightly.

In attempting to breed to improve the quality of eggs, we advise the selection of eggs for incubation only of the kind which you wish to produce. If you want dead-white eggs, do not incubate any that are tinted in the least. If you want a pure, uniform brown egg, then select only that kind. See that none of them weigh less than two ounces and are of the perfect shape which you desire, and all of sound, smooth shell. Use males for mating with these selected hens that were hatched from hens that lay the same kind of an egg. Use the same process of selection the following year, and in a short period of time you will find that the number of eggs which will have to be culled out will grow gradually less and less. A much larger percentage of your eggs will grade as firsts.

It is advisable to use hens for breeding purposes because they lay a larger egg than the pullets, and they lay fewer eggs in the fall and winter and are in much better condition for breeding purposes in the spring months than are the pullets. By all means, in breeding for quality in eggs, use pure-bred fowls. It would be an endless task to try to change the quality of eggs by breeding from mongrels and nondescripts. Neither will you make much progress by trying to breed from grades or crossbreeds.

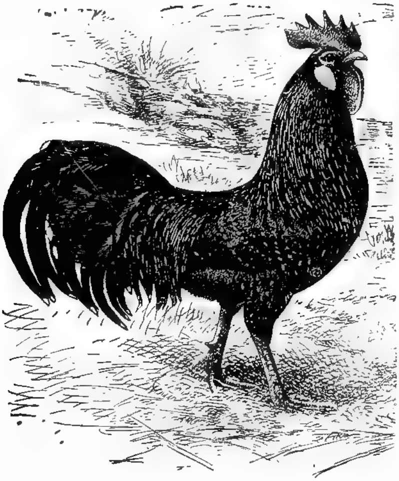
HANDLING EGGS ON THE FARM

Right Management Essential

Those who make the largest profits in any line of business are those who are the best managers. The same law holds good in the production of market eggs of quality.

SWAT THE ROOSTER

The one fault in the management of farm flocks which from the viewpoint of improving the quality of market eggs, is worse than all others combined, is the almost universal practice of allowing the males the freedom of the flock after the hatching season is over. Nine-tenths of the vast number of eggs that are candled out every summer as unfit for food are fertile eggs in which the germ has started to develop. A temperature of seventy degrees will start the germ in a fertile egg to slowly developing. A fertile egg, subjected to a temperature of one hundred degrees for twenty-four hours, will be unfit for food, while an infertile egg may be subjected to the same temperature for a week and still be perfectly good for cooking purposes. The simple expedient of shutting up or disposing of the adult male birds as soon as the hatching season is over, if it should become the general custom, would result in the saving of millions of dollars' worth of eggs every season. Another important advantage in having no males in the laying pens is the fact that the hens without males running with them are much more gentle and quiet. The male is a disturbing factor.



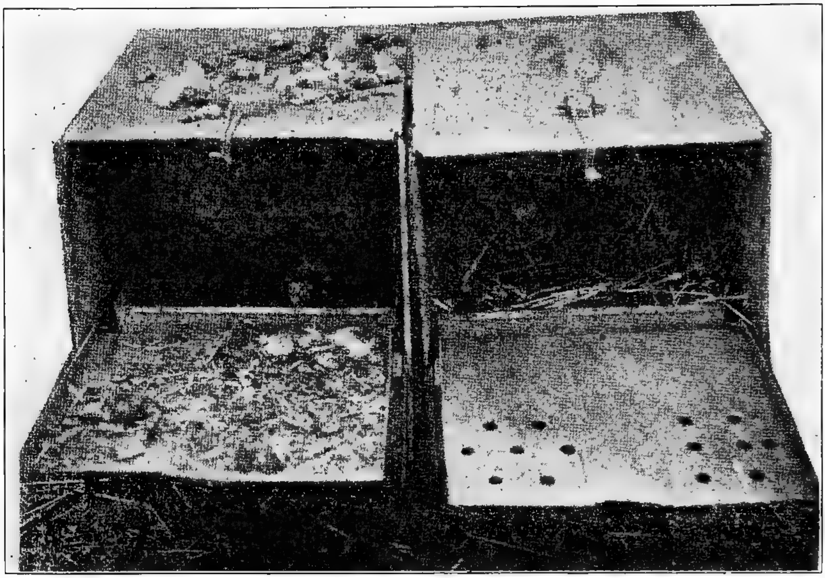
Swat the rooster. The rooster is all right and is a necessary evil during the breeding season, but should never be allowed to run with the laying hens in hot summer months.

VALUABLE MALE BIRDS

No one asks or expects a farmer or poultry raiser to kill or sell valuable breeding males. You might not be able to find what you would want to take their places the following season. The males would be better off, however and so would the females and would make better breeders the following season, if the males were confined to separate quarters and kept with but few, if any, hens. Especially is this true in hot weather and during the moult. Keep the males from the laying hens and market infertile eggs. Unless you are certain you will need the males another season, it is best to sell them and to give the room to the young stock. The feed the old males will eat and which you would save would almost pay for new males, thus giving you new blood and, perhaps, better males. Consider all these facts before acting.

PROVIDE CLEAN, ROOMY NESTS.

One point in management commonly overlooked is the providing of a sufficient number of clean, roomy nests. Too few nests, or nests containing filthy nesting material, cause the hens to steal their nests. Thus many of the eggs are lost, or, if found, are in bad condition. You should provide one nest for every four or five hens. Place them in a darkened place to prevent egg eating and floor eggs.



A dirty nest and a clean nest. One breeds vermin and soils the eggs; the other is clean and sweet and will aid in the prevention of dirty and stained eggs.

GATHER THE EGGS OFTEN.

Because the deterioration which takes place in an egg is not easily visible to the naked eye as it is in fruit, vegetables, etc., we sometimes fail to appreciate the fact that it is one of the most perishable of all food products, and that, therefore, it should have the best of care and treatment from the time it is laid until it reaches the consumer's table. Only in this way can the producer ever hope to receive much better prices.

During the hatching season, when hens are constantly becoming broody, and during the warm summer and early fall months, the eggs should be gathered religiously twice a day. All broody hens that are to be used for hatching purposes should be immediately removed to another place and all others broken up. It is surprising how quickly a broody hen can spoil a fresh egg, especially if the egg is fertile.

INCUBATOR EGGS.

Some farmers and poultry raisers make a practice of putting eggs on the market which they have had in an incubator for a few days and found the eggs to be infertile. This is a bad practice and should never be done by any honest farmer or poultry raiser. You make good use of such eggs by consuming them at home. They will do to fry, for baking and for certain kinds of cooking, but they are absolutely unfit for the market. Such eggs, while good for home consumption, are absolutely unfit for shipping. The yolks will break, the eggs will rot before they can reach the consumer, and it is a dishonest practice to offer such eggs for sale as fresh-laid eggs, and you lower the price on all eggs by so doing. Consume such eggs at home.

We have seen severe market losses due to a habit of sending infertile incubator eggs into commerce. This has been especially noticeable in the large houses making a specialty of breaking out eggs where they found it absolutely necessary to candle even in March and early April because farmers and poultry raisers were marketing infertile incubator eggs with their fresh eggs, and the incubator eggs came in in such bad condition and were so numerous that they had to be culled out before it was safe for the breakers to handle the eggs. At that time of the year there is no other reason for candling. You can see what a loss this means to any dealer, and instead of reducing the army of candlers which are now required this practice makes a demand for even a greater number.

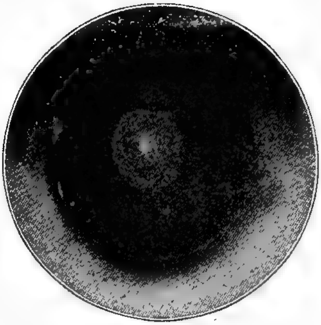
Gather eggs daily. Eggs found in hay lofts, weeds, fence corners, etc., should not be marketed.

Another important reason why such eggs as those taken from an incubator or from underneath a hen should not be marketed is the danger of their mixture with storage stock. These incubator eggs usually go on the market at the season when eggs are being stored without being candled. We know it to be a fact that infertile incubator eggs break down during transportation and handling and easily become "white rots."

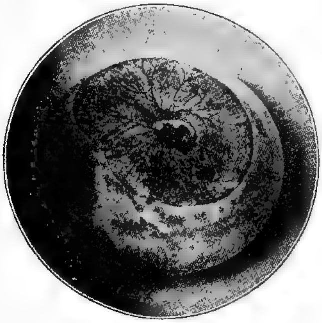
Infertile incubator eggs can be used for bakers' purposes in the home, but under no circumstances should they ever be offered for sale or for shipment.

Another important reason why such eggs should not be marketed for fresh eggs is the fact that they are liable to be seized by food inspectors as being misbranded. Such eggs play havoc with the spring storage stock, and we are in hopes that no farmer or poultry raiser will be guilty of such a dishonest practice.

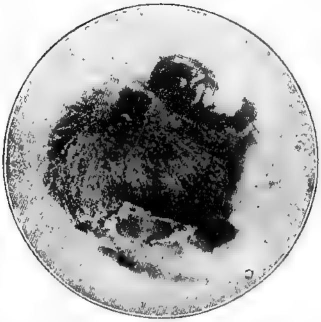
FERTILE EGGS SPOIL QUICKLY IN SUMMER WEATHER.



No. 1. Fertile egg after 24 hours at 103° F.
FERTILE GERM BEGINNING TO HATCH.
NOT PERFECT FOR FOOD.

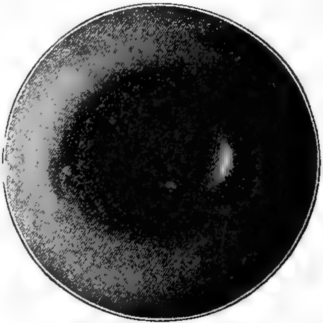


No. 4. Fertile egg after 72 hours at 103° F.
BLOOD VESSELS OF EMBRYO CHICK CLEARLY MARKED.

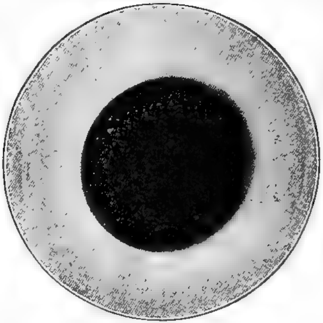


No. 5. Fertile egg after 7 days at 103° F.
COMPARE WITH INFERTILE EGG AND FRESH EGG.

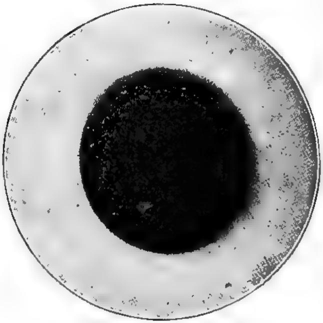
INFERTILE EGGS KEEP BEST AND MARKET BEST IN SUMMER HEAT.



1A. Infertile egg after 24 hours at 103° F.
NO FERTILE GERM. NO BLOOD RING. STILL GOOD FOOD. IT WOULD BE STILL BETTER IF KEPT COOL.



4A. Infertile egg after 72 hours at 103° F.
NOT AN ABSOLUTELY FRESH EGG,
BUT USEFUL IN COOKERY.



5A. Infertile egg after 7 days at 103° F.
STILL USABLE FOR FOOD. IT WOULD BE A PERFECT EGG IF IT HAD BEEN KEPT COOL.
COMPARE WITH FRESH EGG AND FERTILE EGG.

The effects of incubation upon fertile and infertile eggs. Those on the left are fertile and those on the right are infertile.—Courtesy of United States Department of Agriculture, Bureau of Animal Industry.

CONFINE BROODY HENS.

A few broody hens in the poultry house where you have your laying stock can soon cause considerable loss and deterioration in the quality of market eggs. Other hens will lay in the nest with them and they should be confined. Put them up in a broody coop and break them from sitting or else move them to the hatching or sitting department. Never allow broody hens to remain on the nests in the laying house. By sitting on eggs which are fertilized even for a few hours they will start chick development.

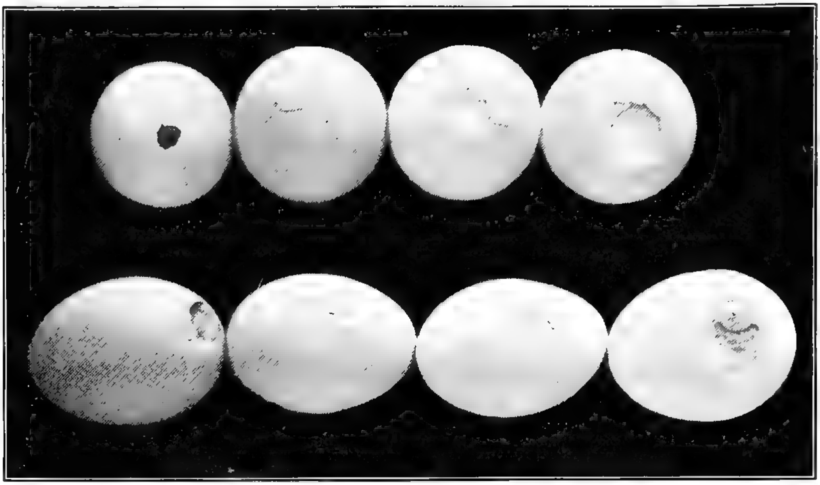
Jail for breaking up broody hens. They should be confined as soon as they show evidence of broodiness, unless you wish to remove them to your hatching house. Broody hens, if allowed to remain on nests containing fertile eggs, will soon render the eggs unfit for food.

KEEP EGGS IN A COOL PLACE.

Many farm eggs are kept in a warm room or pantry adjoining the kitchen until the time comes to take them to market. A worse place could not possibly be found for them. Not only does the heat cause them to deteriorate rapidly, but they readily absorb the odor of cooking vegetables thus still further impairing their flavor. All eggs, as fast as gathered, should be put in the coolest place that can be found on the farm.

GRADE THEM CAREFULLY.

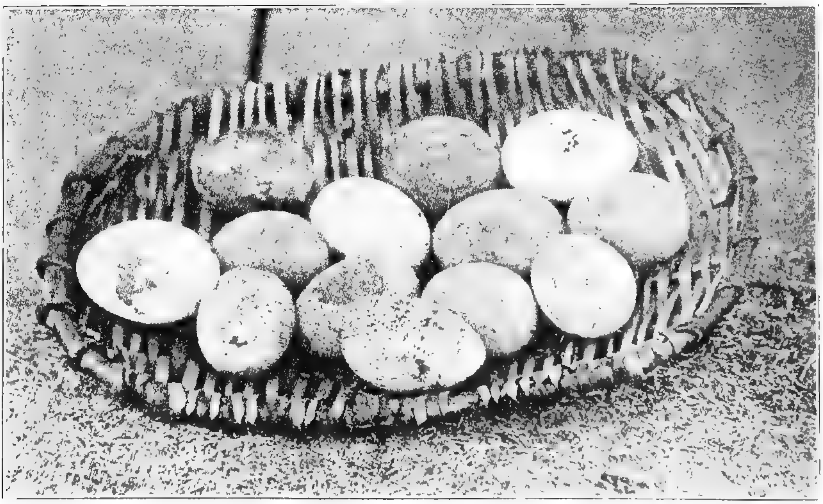
Some one has well said, "Show me the eggs which the farmer brings to market and I will tell you what kind of a farmer he is." Every self-respecting and progressive farmer takes a pride in the quality and appearance of the products of his farm, regardless of whether those products are hogs, horses or eggs. All eggs should be graded before leaving the farm, both as to size and appearance. All small, dirty, or misshapen eggs should be culled out and used at home. An egg which is soiled or stained is not only unattractive in appearance, but also spoils much more quickly. All small eggs are separated when they reach the dealer and are sold as "seconds," bringing from three to six cents per dozen less than the larger eggs which are known as "firsts." Likewise, all soiled eggs are combined and sold as "dirties," bringing a lower price even than seconds. The sooner farmers generally realize the wisdom of doing their own grading the sooner general egg prices will begin to rise and the production of market eggs become more profitable.



All eggs intended for shipment and market purposes, should be carefully graded and well packed in substantial cases, boxes or crates. Don't attempt to market thin shelled eggs. One egg may break and its contents cause the fillers to become dampened and broken down, and this usually results in a number of cracked and smeared eggs, surrounding the broken one.

DIRTY EGGS.

It is surprising what a large proportion of dirty eggs are marketed. A recent visit to a wholesale egg dealer during a prolonged wet spell revealed the fact that fully half the farm eggs that were coming in at that time had



Dirty or washed eggs bring low prices and should be consumed at home.

to be thrown out as dirties. It is not putting it too strongly to say that nine-tenths of all dirty eggs are due to carelessness. They are due chiefly to three causes: First, too few nests, causing the hens to hide their nests in dirty wet places; second, unclean nests; third, allowing hens free range in wet weather. The last is perhaps the most common cause. If the hen house is so small that the hens cannot be kept in it comfortably for two or three days during a rainy spell, a small yard should be provided in which the ground is kept well covered with straw. Don't allow the hens out on the ground during wet and muddy weather until in the afternoon, when practically all hens have laid.

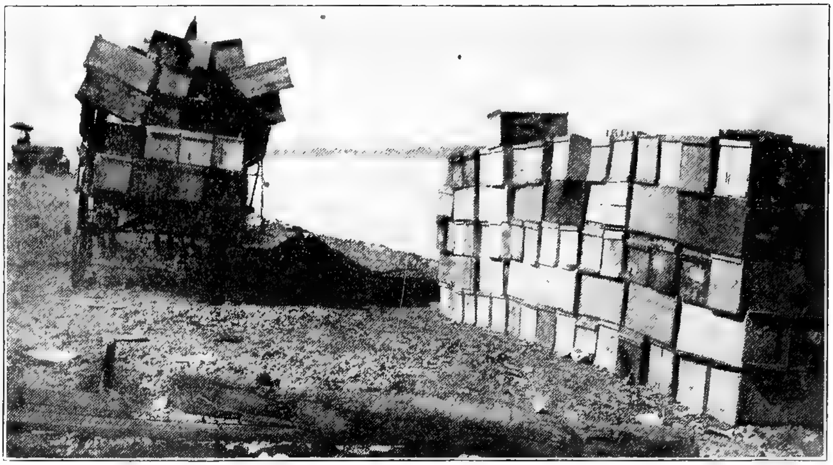
WASHED EGGS.

In this connection a word of warning with regard to washing eggs is in place. Where eggs are being sold direct to the consumer for immediate consumption, it is advisable to wash those that have become soiled, but it should never be done where eggs are marketed through dealers. While the appearance of the egg will be greatly improved (although it is next to impossible to wash an egg so that it will not show stains where the dirt was), yet the keeping qualities of the eggs are really impaired by so doing. The reason is that in washing the egg a mucous coating provided by nature as a protection against germs, etc., is removed, and the eggs will spoil much more quickly than it would had it been left in its natural condition. In grading eggs at the wholesale houses, washed eggs are instantly detected by the experts and thrown in with the dirties. Thus the wisdom of guarding against the production of dirty eggs and of using such eggs as do become soiled at home is plainly evident.

MARKET THEM OFTEN

The egg is a perishable food product—nearly as much so as a peach or a strawberry. From the moment it is laid until it reaches the consumer's table there is a constant deterioration in quality and flavor. The deterioration is rapid in warm weather, especially where the eggs are fertile, twenty-four hours in some cases rendering eggs unfit for eating purposes. The ideal way is to market the eggs daily, but unless they are being produced in large numbers this is not practicable under average farm conditions. It should be made a positive rule on all farms, however, to market the eggs not less than twice a week in warm weather. Once a week is not often enough unless one has facilities for cooling the eggs down to fifty degrees or less and keeping them at that temperature until they are marketed. Comparatively few farmers are in position to take this necessary precaution. The only alternative is to hustle them to the consumer as quickly as possible after they are laid.

A case of eggs being taken to market The eggs are tied on behind the buggy, the fertile eggs are exposed to the hot summer's sun, while the occupants are protected from the sun's rays by an umbrella.

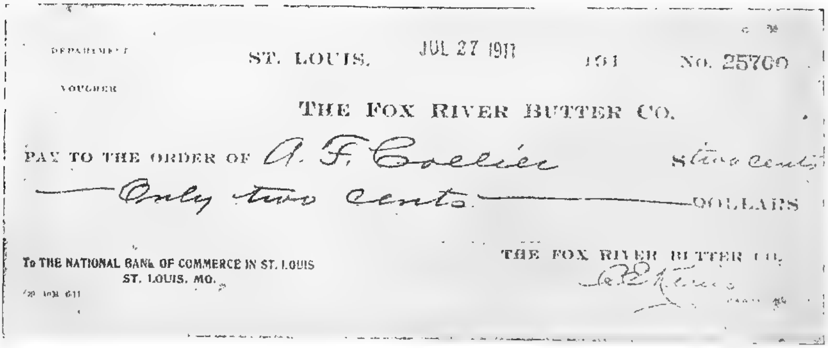


Dumping condemned eggs into the Mississippi river at St. Louis. On this day 72,000 deteriorated eggs were dumped, and during the single week over one million eggs were destroyed. Fifty per cent of the eggs which were received in St. Louis that month were unfit for food.

HOW TO PREVENT LOSS.

In conclusion it may be said that there are a few simple rules which, if carefully observed, will increase the selling price of market eggs to the extent of several million dollars a year and make them sought after in the fancy egg markets of the world. These rules are:

1. Give the hens clean nests and plenty of them.
2. Gather eggs twice daily during warm weather and daily during other seasons.
3. Handle eggs just as little as possible. Every time they are handled they deteriorate.



DEPARTMENT

VOUCHER

ST. LOUIS, JUL 27 1911 191 No. 25760

THE FOX RIVER BUTTER CO.

PAY TO THE ORDER OF A. F. Collier $ two cents

—— Only two cents ———— DOLLARS

To THE NATIONAL BANK OF COMMERCE IN ST. LOUIS
ST. LOUIS, MO.

THE FOX RIVER BUTTER CO.

A deal in high finance. A draft for two cents, received by a dealer for a thirty dozen case of eggs, for which he paid $4.50. Loss largely due to farmers marketing fertile eggs during the hot summer months.

4. Market eggs of a correct size, 24 to 28 ounces per dozen.
5. Overly large or very small eggs should be culled out.
6. Clean eggs only will bring best prices. Have clean nests and clean houses. Never wash the eggs as it spoils the bloom and spoils the keeping quality. The last thing a hen does before laying an egg is to deposit a fluid about it which seals it, as it were, and acts as a protection.

7. Produce infertile eggs. They stand shipment better than fertile eggs; they do not develop germs, withstand the heat, cost less to produce, and seldom decay from any trouble in the interior of the egg. Kill, sell or confine the mature male birds as soon as the hatching season is over.

8. Keep the eggs in a cool place. A dry, cool room, or a dry, cool basement or cellar, will prevent shrinkage, mold and chick development.

9. Don't let eggs come in contact with bad odors such as paints, kerosene, cabbage or decaying vegetables or meat.

10. Held eggs deteriorate. They shrink in weight, evaporation takes place and they lose their flavor and freshness. Market the eggs twice a week in hot weather.

11. Keep one variety of poultry and produce eggs of one color.

12. Market your eggs in clean, 30-dozen cases, or in cartons holding one dozen eggs, depending upon the demand.

13. Don't expose eggs to flies and dust and dirt and thus spoil their appearance.

14. Confine broody hens or remove them at once to the hatching department.

15. Never expose market eggs to the direct rays of the sun, to extreme heat or to rain.

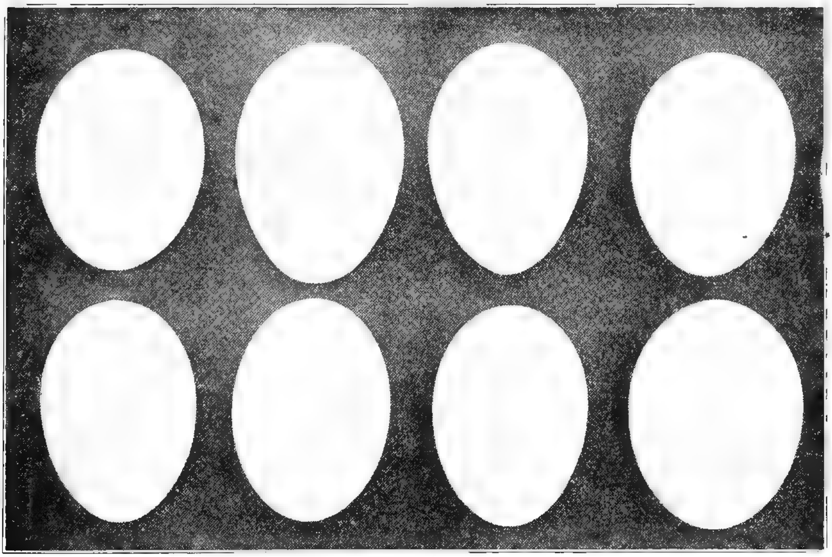
16. Keep the poultry houses free from vermin, clean and sanitary.

17. Feed wholesome food and provide pure water in clean vessels.

18. Sell your eggs only to buyers who buy loss-off and who are willing to pay you for quality.

EGGS ARE A FINISHED PRODUCT

Eggs can be marketed to a better advantage throughout the year than any other poultry product. When gathered from the nest they are a finished product, ready for packing and shipment, without having to go through any other process or putting the poultryman to any other trouble.



High grade, strictly fresh, infertile eggs which are always in demand, which will keep in hot weather, will stand shipping, and will bring top prices in the best markets. Produce this kind.

BEAR THESE FACTS IN MIND

Special attention should be given to gathering eggs in hot and rainy weather. A fertile egg begins to incubate and the chick begins to develop before the egg leaves the hen's body. If such an egg is laid on a hot day and the egg remains in the nest for any considerable length of time incubation will continue until the egg will be unfit for food. During the rainy weather the mud and filth adhere to the feet and feathers of the hens. The eggs will become soiled if allowed to accumulate in the nests. Dirty eggs are graded generally into three classes:

(1) Plain "dirties."

(2) Stained eggs—those soiled by damp straw, manure, or other material which discolors the shell.

(3) Smeared eggs—those covered with the contents of broken eggs.

These are sold at best twenty per cent below market quotations for good eggs, and the producer is charged with this loss. The storage houses, the jobbers and commission men do not suffer the loss on bad eggs because they know by years of experience about what the loss will be at certain seasons of the year, so they make the price accordingly. The local dealers and merchants don't lose it because their buying price is one that enables them to sell with profit on the market, so the farmer and the consumer are the ones that lose most after all.

Don't wash the egg or expose it to moisture. The egg-shell itself is not germ proof, for the pores which admit the air for the chick to breathe are large enough to admit bacteria, but the membrane beneath the shell is germ-proof so long as it remains dry. When it becomes damp, bacteria will grow right through it. The exterior of an egg is the lodging place of bacteria and bacterial spores of all kinds, and once an egg becomes damp, decomposition speedily follows.

The producer is directly responsible for the quality of the eggs until they are sold in the country store, or the shipper, and he is indirectly responsible for any deterioration that may come to these eggs after they leave his hands, providing it is within his power to prevent that deterioration.

The manner of hauling has much to do with the quality of the eggs, whether fertile or infertile. The farmer who hauls his eggs to town in an open wagon in the hot sun, cannot expect to have first class eggs upon arrival. The jarring caused by the rough roads will break down the membrane separating the white and the yolk of the egg and the contents will mix. Then it is only a short time until the egg deteriorates, and we have a mixed rot. Careful handling is essential to a first class product.

Never place the eggs in a case as long as they are warm and contain any animal heat.

Heat favors the growth of bacteria.

Eggs stored in damp places mold and sour very easily.

Do not market thin-shelled eggs as they are easily broken and contaminate the good eggs.

In selling, insist that the transaction be on a quality basis. In selling your eggs by the case-count system, you are compensating your dealer for a loss of about two cents per dozen on your neighbor's bad eggs. Selling on the quality basis you get paid for just what you market, and your neighbor has to stand his own loss.

CAUSES OF LOSS

The causes of loss in handling and marketing eggs can be summed up as follows:

Interior

Incubation, chick development.

Evaporation, loss in freshness and flavor.

Decay, rottenness.

Must, mold, bad flavor.

Diffusion of white and yolk.

Exterior.

Dirt.

Cracks, rough handling.

Smallness.

Lack of uniformity.

Exposure to odors, dampness or heat.

Contact with decaying vegetables or meat.

PERCENTAGE OF LOSS IN BAD EGGS ON THE FARM

Dirty eggs	2%	Shrunken or held eggs	5 %
Breakage	2%	Rotten eggs	2.5%
Chick development and heated eggs	5%	Moldy or bad-flavored eggs	1.5%

The above figures are given as an estimate of the loss as compared with the total crop value as given by the United States Department of Agriculture in Circular 140, Bureau of Animal Industry.

You will notice from the above that the total loss in bad eggs is seventeen per cent of all the eggs marketed each year. Figuring on this basis, the annual loss on eggs in Missouri is over $4,000,000 annually. The farmer is losing a large part of his profits each year because of carelessness. If only good eggs reached the consumer, you can readily see how he could well afford to pay a better price. Of course, eggs are naturally of poorer quality during the summer months, but, on the other hand, the quality could be improved a great deal if everybody would handle the product promptly. A number of years ago eggs were such a common and cheap commodity that there was not a great deal of care taken in the handling of them, but now that the business has grown to such an extent in the last few years, we think that producers and dealers in this commodity should get out of their old, antiquated ways and handle them in a modern, up-to-date manner.

The real loss on eggs can scarcely be estimated. It comes from four different sources:

(1) Loss in price because of the poor quality of a large number of the eggs themselves.

(2) Loss in transportation charges on eggs which are worthless.

(3) Loss entailed by necessity for a large army of graders, candlers, and others in sorting the good from the bad and preparing the eggs for market.

(4) Loss due to curtailed consumption because of doubtful eggs, which cuts down the demand and lowers the price.

People do not relish bad eggs, and if such are served to them they are likely to call for something else next time. Nothing is a sweeter, more relished or nutritious food than a good egg, and there is nothing more despised than a bad egg. If high quality eggs were the rule instead of the exception, we feel safe in saying that the present consumption of eggs would be doubled, and we would not only have to increase the quantity produced by keeping more hens but we would also get an increase in price, and thus greatly increase the profit from the poultry yard. The public in general would be greatly benefited, but the farmers themselves would be the chief beneficiaries in the improvement of the market egg.

INTERNAL FACTORS AFFECTING THE QUALITY OF EGGS.

The factors affecting market eggs have been given as careful and exhaustive study by Prof. E. W. Benjamin of Cornell University as by perhaps any other one man. We cover this subject from our view point in some of our other lessons and in order that you may get the ideas of other experts with whom we agree, we quote you from Prof. Benjamin of Cornell:

FACTORS DETERMINING THE SHAPE.

"The shape of the normal egg is probably determined by many factors, including the tension of the oviduct walls and the size of the egg. If we consider the shape of the egg to be the result of the physical forces in the oviduct walls, tending to push the egg forward, it is the natural assumption that these forces would tend to make the rear of the egg pointed. Nearly all authorities agree, however, that the egg is not always laid blunt end foremost. This would indicate that the foregoing theory of forces is at fault, or that the position of the egg often becomes reversed in the uterus.

TESTING FOR EVAPORATION.

"A fairly accurate method of learning the method of evaporation that eggs have undergone is by placing them in a dish of water. A fresh egg will lie nearly flat on the bottom of the dish, but if the egg is slightly evaporated the end bearing the air cell will tip up slightly. This tendency to tip up increases with the degree of evaporation, until a very much evaporated egg will float on the surface of the water. This is a method that can be used by the consumer, but it does not show interior quality except so far as evaporation is concerned.

OVARIAN CONDITIONS

Double-yolk Eggs.

"Detailed reports have been made by Glaser of double-yolk eggs resulting from the joining of two yolk sacs during their development. These sacs gradually develop one common blood supply, their growth become identical or nearly so, and both yolks mature and drop into the oviduct at about the same time. It is supposed that two yolks may develop within the same yolk sac, and sometimes within the same vitelline membrane.

Multigerminal Disks.

"Many yolks have more than one germinal disk, these showing as several round light spots on the surface of the yolk. Only one of these disks usually shows development when an egg is incubated.

Misplaced Yolks.

"Yolks are sometimes dropped into the oviduct before they are mature, and thus appear as abnormal yolks in the completed egg. Sometimes yolks are dropped outside the oviduct into the body cavity; they are then probably absorbed by the body tissue in most cases.

Blood Clots.

"Perhaps the commonest of the faults arising in the ovary is the blood clot. This is usually caused by the rupture of a blood vessel when the yolk sac splits in order to allow the escape of the mature yolk into the oviduct. This rupture may be the result of such abnormal circumstances as a split occuring in some part of the yolk sac other than at the suture line, or a crossing of the suture line by a blood vessel. Ruptures of other tissues may have a similar effect. Blood clots seem to occur relatively oftener during the first laying period of pullets and during the spring period of heavy production than at other times. This is probably due to the extra heavy strain on the egg organs at these times.

"The clot of blood adheres to the yolk as it passes through the oviduct and if it is of good size it may be distinctly seen when candling. A blood clot can be distinguished from other spots by its bright red color and by the fact that it is on the surface of the yolk and moves only with the diffuse-colored area of the egg. When the egg is opened the clot can be distinctly seen. If it is removed, the egg is suitable for use as food unless otherwise defective. An ordinary blood clot does not color the albumen; if the albumen is colored, the egg is termed a bloody egg.

"Because of the presence of blood in these eggs they are often confused with incubator eggs and customers refuse to use them for any purpose. Hotel stewards require that all their eggs shall be candled for the purpose of eliminating the eggs with blood clots. The producer or dealer should make use of many of them and avoid the waste. It is believed that certain hens have a tendency to produce these clots, and by culling such birds from the flock the percentage of blood-colt eggs can be greatly reduced. Blood clots are probably detrimental to the keeping quality of eggs. (Blood clots are caused in some cases by a flock being fed too freely on forcing foods.)

OVIDUCT CONDITIONS.

Body Heated Eggs.

"An egg is forced through the oviduct by the peristaltic action of the muscles in the oviduct wall. Sometimes, apparently due to fright, this action ceases temporarily, and the egg is held in the body of the fowl for several days after it is completed. This keeps the egg at body temperature, and incubation begins. If the egg is fertile, the results are disastrous at once. If the egg is infertile, of course the results are not so serious and the egg may be fit for use when laid, depending on the extent to which the egg was infected while being held in the body of the hen.

Eggs within Eggs.

"When an egg has passed through the oviduct and is ready to be laid, a reverse peristaltic action may be incited in some way, and the egg will be forced back up the oviduct until normal forces again push it along its regular course. In this way one yolk may be enveloped with two complete sets of albumen, shell membranes, and shell. Three sets have been known to be formed over a single yolk, probably in this way. Sometimes other yolks are met by the ascending egg and the whole is surrounded by one set of albumen, shell membranes, and shell. The first egg, in any case, is usually an abnormally small one, and this may often account for the reversal of the peristaltic forces.

Yolk Substitution.

"Grain or fragments of other foreign substances may be forced up the oviduct from the cloaca. This has been known to occur, and during the normal return of such substances the oviduct glands have secreted albumen, shell membranes and shell, forming a complete egg except that a foreign body has been substituted for the yolk.

Foreign Substances within Egg.

"Due to causes similar to those resulting in yolk substitution, grains and other foreign substances are sometimes found floating in the albumen. If an egg has previously been broken in the oviduct, the broken contents may gradually harden and cling to the oviduct walls. Later they may become detached and pass along with the egg. In this way various forms of dried yolk and albumen may be deposited in eggs; rings of dried yolk and albumen have been observed, as well as various other peculiar shapes.

Intestinal Worms within Eggs.

"Intestinal worms are sometimes found in eggs. They apparently gain access to the oviduct from the large intestines and are later included in an egg as it is being formed. These worms vary in size and form, but are usually white in color.

Double-yolk and Connected Eggs.

"If one yolk drops into the oviduct shortly after another, even though this is due to no abnormal condition of the ovary, the one secretion of albumen may surround both yolks and form a double-yolk egg as previously described. A few cases of triple-yolk eggs, apparently formed in the same way, have also been described. If the yolks are too far apart to be enclosed as one egg, they may still remain connected in various ways. A small amount of albumen, with shell membranes and shell, may connect the two complete eggs. The two adjacent chalazae may be either continuous or separate. Sometimes only the shell membranes connect the eggs, neither albumen nor shell being present.

Soft Shelled Eggs.

"Eggs are sometimes produced having only a very thin shell or having no shell material at all. Eggs of this type are the result of a condition that may be caused by a lack of lime in the glands of uterus or by one egg forcing the next egg out of the body of the fowl before the shell can be formed. Soft shelled eggs occur, therefore, most frequently during the period of heavy egg production. (The shell forming portion of the oviduct may be diseased and cause soft shelled eggs.)

Meat Spots.

"Particles appearing like pieces of liver are often found floating in the albumen. On closer examination these particles seem to be pieces of the dead glands of the oviduct wall, and, since they occur very often, they are thought to be fragments of this waste tissue. In candling eggs it will be noted that meat spots appear very dark and float near the shell. They may be of various shapes or may consist of several very small, floating specks. They lack the characteristic red appearance of a blood clot, and are free from the yolk. When an egg having this peculiarity is broken open, the meat spot is sometimes found attached to one of the chalazae or it may float entirely free. If it is removed, the egg is satisfactory for use as food unless otherwise defective. Such eggs are treated on the market in the same manner as are those having blood clots.

Bloody Eggs.

"The oviduct often becomes injured and irritated so that blood is exuded with the albumen, making the albumen appear distinctly bloody. This condition may appear throughout an egg or in certain parts of it, as already mentioned. Bloody eggs are commoner with pullets just beginning to lay or during the heavy laying period than at other times, as in the case of blood clots, and are probably due largely to over exertion of the oviduct. The blood in the albumen is often concentrated about the chalazae, but this is not always the case. Certain individuals of the flock are generally responsible for all the bloody eggs, and it is well to remove these fowls when they are discovered. It is usually impossible to remove the affected part of the albumen; therefore the egg is useless. Because of this, bloody eggs are a more serious loss than those having blood clots or meat spots.

LOOSE SHELL MEMBRANE.

"Sometimes fragments resembling parts of the shell membrane are found floating in the albumen. These are apparently due to slight secretions of the shell membrane glands in the isthmus, which have formed little fragments of membrane that cling to the walls of the isthmus. When the next egg passes through the oviduct, these membranous fragments are carried along and float free in the albumen. They are not detrimental to the quality of the egg, but eggs bearing them are usually discarded because of their suspicious appearance to persons not understanding the cause. The term "tapeworm" is a popular one given by egg candlers to this type of egg, because of its peculiar appearance.

PERCENTAGE OF EGG CROP EACH MONTH.

January	6.6%	July	9.6%
February	7.1%	August	8.6%
March	12.4%	September	6.2%
April	13.4%	October	4.2%
May	13.3%	November	3.1%
June	10.7%	December	4.8%

The above figures were given in Bulletin No. 101, United States Department of Agriculture, Bureau of Statistics.

You will notice from the above that 49.8 per cent of the eggs are produced during the months of March, April, May and June. The best quality eggs, as far as market is concerned, are produced in April.

COST OF PRODUCING EGGS.

This varies in different localities and according to the conditions under which they are kept.

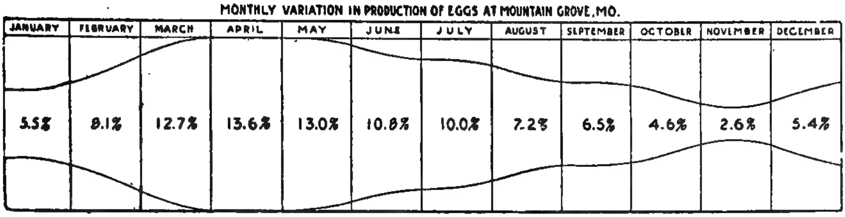
Where hens are kept in small flocks and on the general farms of the Central States, we believe that eggs can be produced at a profit at an average price of 20c per dozen. Here hens rake and pick up much of their own living.

On the commercial poultry farms located in the grain growing states, eggs can be produced at a profit if they can be sold at an average price of 40 to 45c per dozen. Here grain and other supplies can be bought at comparatively reasonable prices.

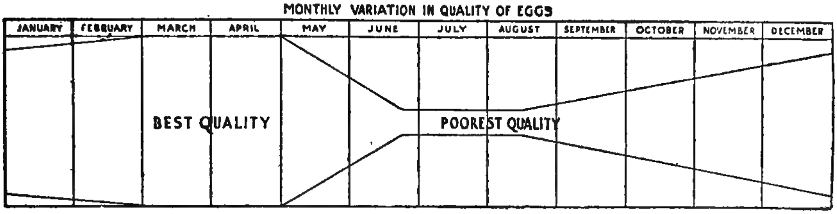
In the extreme Central States, eggs cannot be produced on the commercial farm for less than 50 to 52c and allow for a reasonable profit. This may seem high, but in all three cases mentioned, by selling some hatching eggs, a little breeding stock, and baby chicks, your average will be brought up so that it is possible for a thoroughly competent poultryman to average these prices in any of the three sections mentioned.

It is too true that our average poultryman does not keep an accurate record of the cost of production. Millions of dollars worth of poultry and eggs are annually produced and thrown upon the market for what they will bring. "The accuracy of this statement is easily verified," said Mr. H. Armstrong Roberts in writing on this subject in the Country Gentleman:

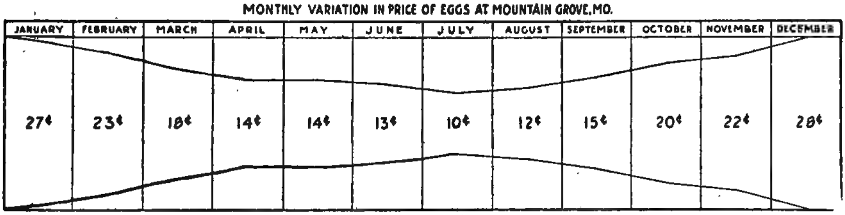
"Farmers and commercial poultrymen are never consulted in the matter of prices. Production costs never enter into their transactions. They forward their eggs to certain market centers and are paid according to current market quotations. The market quotations are based on what others are



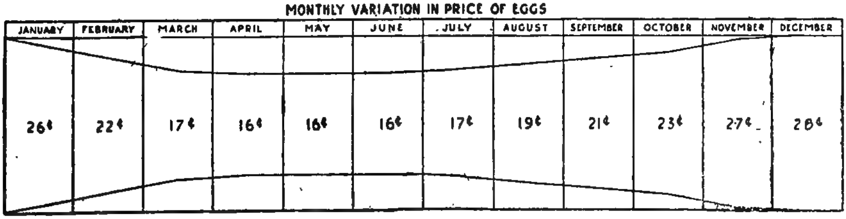
The monthly variation in the production of eggs. This is based on the eggs gathered from 1,000 hens at Missouri Experiment Station each year for three years.



Monthly variation in the quality of eggs througout Missouri and Central United States. In March and April the pullets are mature, the eggs are of good size, and the quality of eggs are the best. From the 15th of June to the 15th of August the quality is usually the lowest.



Monthly variation in the price of eggs in Missouri. The highest price is paid in December, 28 cents, and the lowest price is usually in July when they get down as low as 9 and 10 cents per dozen because of the large quantity of poor quality eggs which are placed on the market.



Monthly variation in the average price of eggs in twelve of the leading markets of the United States. The lowest average price paid in these cities is 16 cents per dozen, and the highest average price is 28 cents.

willing to bid for the goods, high or low, depending upon the season of the year, the supplies in hand and immediate demands. The terms offered may net a profit to the producer, or they may not. Very often they fail to do so. It is hit or miss. The same idea holds true of most food products; and we call this system the law of supply and demand."

IS COST OF PRODUCTION ROBBERY?

"Suppose all lines of merchandising including the various mechanical trades were conducted on this principle. Fancy a shoe factory turning out 100,000 pairs of shoes without some definite knowledge of the prices it is going to receive for the goods. Imagine a contractor performing a piece of work, such as the erection of a factory building, and then accepting as payment any sum which the owner might be willing to offer.

"Fancy a mechanic undertaking a job without first agreeing on the wages he is to be paid for his services. The cry would go up that business could not be run on such haphazard principles, which is true.

"The poultryman's cost of production is just as definite as the builder's. To produce a dozen eggs involves materials, labor and overhead charges, to which should be added a fair profit. If eggs were sold on this basis, the consumer would have to pay an average of fifty-two cents a dozen the year around.

"Such a price is outrageous," housewives will exclaim at this statement. "Monstrous! It's robbery—downright thievery! Never heard of such a price as fifty-two cents for eggs.

"Because the housewife has never had to pay such a price; because, in fact, she has seldom paid what eggs were really worth, she assumes that any departure from the customary prices is absolutely unwarranted. Egg buyers are dead set against paying what they choose to call fancy prices.

"The reason is that for years the consumer has been misled—spoiled, if you like—concerning the values of certain foodstuffs, especially eggs. Heretofore eggs have been cheap, much too cheap; in many instances they have been supplied at prices below the actual cost of production. They were cheap because the bulk of the supplies came from farms in the Mississippi Valley, where fowls were regarded merely as a side issue and their eggs as by-products. Farmers accepted low prices for their eggs because they fancied the eggs had cost them next to nothing to produce. The average price paid for farm eggs during the past ten years was less than sixteen cents a dozen. Indeed in some sections it was difficult to dispose of eggs at any price during the season of heavy production.

"This condition prevailed for so long that it established a precedent, it got the buying public into a frame of mind—a habit—which it is difficult to set aside.

"The time has come, however, when this habit must be broken; the consumer must be educated as to the value of foods—their commercial value which is cost of production plus a profit to the grower, and not some fictitious value brought about by peculiar circumstances. War conditions have made this education compulsory. Generally speaking, there has been such an abundance of food in the past that it amounted to over production, and this over production resulted in low prices—bargain prices.

"All this has changed; the demand has caught up with the supply; if anything, there is an under production, and with it bargain prices have vanished. Farmers find that they must compete with the manufacturer as never before; they find that they must go out into the open market and bid against all other industries for labor, materials and capital; and having to do so, they find that they must be paid the same as other industries—that is, on the basis of cost of production.

"Cheap eggs are a thing of the past; the housewife might just as well become reconciled to this fact now as later. Though she may be utterly opposed to paying more than a certain price, the former boycott action will avail nothing. To discriminate against eggs will result in fewer eggs, because poultrymen are no longer of the mind to throw their products on the market for what they will bring. The truth of the matter is, the poultrymen cannot afford to do it."

The reader will please bear in mind that Mr. Armstrong's figures are based largely on prices and conditions as they exist in the Eastern States.

"The principal topic under the division of materials is feed, and feed is the most vital issue with which we have to contend. Review the market quotations and price lists for 1917 and for the present time, add them together and strike a mean, and you will find that the average price for poultry feeds, both scratch grains and mashes, is four cents a pound. On car-lot quantities the price will be a trifle less; in small quantities it will be a little more; four cents is the average for half-ton lots.

"Reports from thirty of the leading commercial poultry plants throughout the country show that the average cost of feeding a hen is $3.75 a year, under present conditions. This rate represents the bare cost of feed and does not include the labor of placing the feed before the fowls.

A YEAR'S HEN RATIONS.

"To substantiate this rate, if we consult the reports from the egg-laying contests, we find that a hen consumes from eighty to one hundred pounds of grain and mash feed a year. During a recent international contest in the East, each layer consumed the following:

	Pounds
Scratch grains	46.963
Dry mash	45.017
Total	91.980

"There was no guesswork about these quantities; the feed was carefully weighed daily as it was distributed in each pen. In addition to the scratch grains and mash, each hen consumed the following:

	Pounds
Oyster shells	2.102
Grit	.679
Charcoal	.092
Total	2.873

"The one remaining item of food—green stuffs—costs at the rate of twelve cents a hen a year. Thus, with poultry feeds averaging four cents a pound, and shells, grit and charcoal one cent a pound, the foregoing tables will total $3.71; to which add twelve cents for the green food, and the total feed cost per hen is $3.83. This figure coincides very nicely with the reports from the thirty commercial plans. For the purpose of this anaylsis we will add the two averages and strike a mean, which results in a rate of $3.79 as the cost of feeding a hen for a year.

"Other supplies, such as poultry equipment, buildings and so on, might be considered under the head of materials; in this estimate we will reckon them as belonging to the plant, for which a charge will be made under the topic of overhead expenses, where they rightfully belong.

"It is pretty generally agreed that the one-man poultry plant consists of 1,000 layers. True, there is a slack season for about six months of the year, wherein one attendant could easily manage 2,000 layers, or more; but to offset this slack period, there is a corresponding busy season, during the hatching and brooding months, which necessitates additional help, even on the one-man plant. If a farm is to be conducted on up-to-date principles, carefully executed, the equipment kept in repair and new buildings added from time to time, it will require one attendant to each 1,000 birds. This attendant may be the owner of the plant or an employee; whichever he is it constitutes labor, and for the purpose of this estimate we will consider it simply as labor.

"As in all lines of work, the cost of farm labor has increased enormously in the past three years. In some instances it has doubled or trebled former wages. Fifteen dollars a month and board is a thing to look back on. The average farm hand now commands forty and fifty dollars a month and board, or else quarters for his family. Perquisites, such as board and lodging, are important factors these days; they are chargeable as labor costs.

"Therefore we will assume that sixty dollars a month is the value of the poultry attendant's labor. It would hardly be fair to settle on a lower figure.

"Sixty dollars a month, or $720 a year, for the care of 1,000 fowls, means seventy-two cents a bird as the charge for labor. Add this figure to the charge for materials and feed—$3.79—and we have $4.51 as the basis on which to compute overhead expenses. Hence, five per cent of $4.51 equals 22.5 cents as the cost of overhead.

"Some will discredit this item, claiming that while a builder or other enterprise might have fixed operating charges, these charges would not be so great on a poultry plant.

"Very well, let us consider them another way. First of all, bear in mind, thus far the foregoing estimate has not included any charge for capital invested, either in land, buildings, equipment or stock; the estimate has included nothing but feed and labor.

"Overhead expenses or operating charges—the terms are used interchangeably—usually consist of a flat rate determined by the most accurate information to cover such items as interest on the capital invested, depreciation and repairs, insurance, rentals, clerical work, office expenses, telephone, postage, stationery, and so on. A poultry plant has all of these expenses, or most of them, anyhow. But we will consider only a few of the more important—capital, depreciation, insurance.

"There is a mine of information available to prove that it costs at least two dollars a bird to house and start a poultry farm. It generally costs two dollars a bird to house the stock alone. To be conservative, however, we will make two dollars cover everything—houses, poultry equipment, land and a place of residence for the labor. In other words, we will value a 1,000-bird farm, the one-man plant, at $2,000, which is modest indeed, as the majority of poultry farms go.

Overhead is Underestimated.

"The stock for this poultry farm we will value at one dollar a head, which the stock would bring as meat. As standard-bred breeding stock it would be worth at least three dollars a head; very few breeding establishments sell their best birds for less than five dollars. At all events, on a meat basis the stock is worth $1,000. Add this to the value of the plant and we have an investment of $3,000. This capital is worth interest at the rate of six per cent, or $180 a year.

"Buildings and equipment will not last forever; they depreciate every year. On frame structures and similar equipment it is customary to allow five per cent to cover depreciation and cost of repairs and maintenance.

"Therefore, assuming that the buildings and equipment represent three-quarters of the value of the poultry plant, which allows the remaining fourth to cover the value of the real estate or land proper, we have $1,500 on which to figure depreciation. Five per cent of this sum equals seventy-five dollars a year.

"Poultry farm fire insurance on $1,500 will cost about eight dollars a year, depending upon the risks involved. Now add these overhead expenses together:

Interest on capital	$180.00
Depreciation	75.00
Insurance	8.00
Total	$263.00

"Divide this total by 1,000 to give the rate for each bird, and you have 26.3 cents, as against the first equation of 22.5 cents, which was computed on the flat rate of five per cent of the feed and labor. In other words, when you get right down to tacks, the builder's rate of five per cent for overhead expenses will not cover the overhead expenses on the poultry farm.

"And I repeat that in this estimate no consideration has been given to numerous other operating expenses, such as telephone, advertising, salesmanship, packing materials, stationery, postage, purchasing expenses, shipping expenses, and so forth. We'll throw these into the overhead for good measure. Also we'll stick to the flat rate of five per, cent. which amounts to 22.5 cents to the bird. Thus our estimate appears as follows:

Materials (feed)	$3.79
Labor	.72
	$4.51
Overhead expenses 5%	.225
Cost of production	$4.735

"Now what about profit? The above total—$4.735—represents the cost of production, the cost of feeding, housing and maintaining a hen for a year. Is the poultryman expected to throw in his time, ability and enterprise for nothing? Isn't he entitled to a profit for his product, the same as the shoe manufacturer or John Doe's builder?

"Then suppose we add ten per cent for profit; our estimate appears as follows:

Cost of production	$4.735
Profit 10%	.473
Total	$5.208

"The sum of $5.208 now represents total cost of production, plus a profit which means that the poultryman must recover this amount in revenue from each hen in the course of a year.

"As a strictly commercial proposition this revenue must be obtained by the sale of market eggs.

Average Production Too Low.

"According to the statistics furnished by the Department of Agriculture, the average laying capacity of the American hen is less than six dozen eggs a year.

"On commercial egg farms the average production is given as ten dozen eggs to the hen a year. A few farms exceed this average, and individual flocks may score sixteen dozen eggs.

"The average for commercial farms throughout the country would not exceed ten dozen, however, which is easily verified by the yearly reports from the egg-laying contests.

"On this assumption we divide ten into $5.208, which renders fifty-two cents as the average price of a dozen eggs for the year round, to be received by the producer if he would break even with costs of production and make a profit of ten per cent.

"Someone may ask about the value of the hen as meat. This point has been deliberately overlooked in the foregoing estimate. No mention has been made of the hen's value as meat; neither has there been any charge made for the cost of reproduction—the cost of raising young stock to supply pullets to replace the old stock—because the income that would be derived from the hen if she were sold as meat would be about equal to the cost of replacing her with a pullet.

"Astonishing as this estimate may appear, and notwithstanding it may attach a burden to the egg buyer, under existing circumstances the commercial poultryman must receive fifty-two cents a dozen for his eggs the year round.

"The farmer may get by with a little less, because he can feed his hens on waste grain; and the poultryman who sells hatching eggs, baby chicks and breeding stock may get by with a little less, because he commands higher prices for these other products, which add materially to his income; but not so with the commercial breeder—the fellow who has nothing to sell but market eggs."

This cost will vary some according to locality and season, and according to cost of feed, labor and material. In the first place, to make any profit, the right methods must be used. Without using pure bred poultry and deriving a portion of your income from selling hatching eggs, baby chicks and breeding stock, the above estimate is about right for the extreme East or West.

Here is where most farm poultrymen fail. When eggs become plentiful they glut the market and lower the price. A small card in several farm papers and poultry journals will bring a demand for these extra eggs for hatching, or for chicks, and make them profitable instead of a loss.

Egg farming is a business and it must be conducted as a business. One must take advantage of every possible economy of labor and equipment and seize every opening for added income.

METHODS OF SELLING.

Our poultry products are concentrated and valuable and not extremely perishable if properly produced and handled. At some seasons of the year a case of eggs is almost as valuable as a ton of hay, and you can drive to town with a case of eggs in the bed of your buggy and experience no inconvenience, but to market a ton of hay requires a two-horse team and a wagon for transportation. Poultry and eggs are becoming more and more valuable, and there is a constantly increasing demand. If you are growing strawberries and other small fruit, they must be marketed at once or else they will perish upon your hands, and the same is true of milk, butter and other dairy products; yet poultry and eggs can be held for a much longer period of time without serious loss than can any of the articles mentioned if you are prepared to handle them and handle them in the right way. Taking these things into consideration, and with our present improved means of transportation, it is not impossible for the poultryman to place his goods on the best markets of the United States without greatly increased expense. Many railroads have direct refrigerator lines to St. Louis, Chicago and New York, and other markets. The poultryman usually disposes of his products by one or more of the following methods:

First—Selling direct to the consumer.

Second—Selling direct to the retailer or local dealer.

Third—Shipping to commission merchants or jobbers for sale upon the open market.

An egg-breaking room. The eggs are broken, the yolks and whites separated and then frozen and held in cold storage for later consumption.

SELLING TO THE CONSUMER.

It is possible and often profitable to sell eggs direct to the consumers. The greatest difficulties encountered in building up a private trade is the fact that many people will contract for eggs from you in winter months, when eggs are scarce, and are willing to pay you a premium at this time in order to get them, but in spring and summer months, when eggs are plentiful and cheap, they will compel you to compete with the cheap market eggs or else refuse to take yours. If you expect to depend on a private trade, it is best to compel the customer to agree to a yearly price, and this can be so much on the average per year, or you can graduate the price according to the season. But by all means, enter into a contract for the year. Another difficulty is occasioned because of the fact that but few good containers have yet been invented for shipment by parcel post, or in small quantities by express. In shipping to private customers it is a good idea to have advertisements appear on the sides of your containers or cartons similar to this: "Highest quality table eggs from Quality Egg Farm;" "Highest quality new-laid eggs produced from wholesome food and from healthy hens kept under sanitary conditions;" "Every egg carefully selected and every one guaranteed to be fresh and of extra fine quality." Then do as you advertise. This brings confidence in your eggs and your methods of dealing, and also brings new customers.

Whether you should use express or parcel post in the shipment of eggs to private trade, you can best determine by actually trying it out to see which rate is cheaper and which carries more safely and promptly.

Another difficulty you may encounter is this: You may have a good supply of customers who have signed up for the year and your hens may fail you in winter when eggs are highest and in greatest demand. Don't take more customers than you can accommodate and satisfy. Study methods of getting winter eggs so you will have the eggs to sell.

Besides selling to private individuals, it often pays to sell direct to the better class of hotels, restaurants, soda fountains and this class of buyers. You will find it difficult to retain most of these, however, when eggs get very cheap.

SELLING DIRECT TO THE LOCAL DEALERS.

This plan is in more general use by the average farmer than any other. At most seasons of the year the prices paid on the local market justify the production of eggs and at a profit to the farmer. It is usually best to sell eggs at the time of production, as very little is gained, as a rule, in holding eggs for higher prices. Preserving eggs by the present method of using water glass, salt, lime water, etc., is not a good practice if those eggs are intended for market. These eggs on the market create "doubt" again and cause a reduction in price, and will not keep long after they have been removed from the preserving fluid. If you wish to preserve them for home consumption, nobody can offer any objection to so doing.

SHIPPING TO COMMISSION MERCHANTS AND JOBBERS.

If you are operating a commercial egg farm and producing a high grade egg you must of necessity get the very highest market price possible. No one can blame you for marketing your eggs where you can get the most for them, and very often, if you can produce eggs in sufficiently large quantities to justify commission merchants and jobbers in handling them, they can sometimes secure a much better price for you than you can get locally or otherwise. Most of the extreme eastern states, and the same is true of the west, do not produce enough eggs to supply their markets, but import millions of dozens from states which produce a surplus. In such localities as these, and in the centers of population you can usually secure the highest price per dozen. In shipping to commission merchants and jobbers, make certain that you are dealing with reliable firms. You must produce eggs in large quantities, or else form an organization of farmers to market their eggs co-operatively before you can interest these men. You must have sufficient output to justify them in handling your product.

An egg dealer makes a mistake in placing his eggs on the sidewalk and allowing them to remain there several hours exposed to the hot sun. It is a mistaken idea that fertile eggs have to be in an incubator before the germ grows and develops. The growth of the embryo will take place no matter whether the fertile egg is in an incubator, in a hot country store, in a hot living room, in a wagon en route to town over a hot country road, or exposed to the heat or sun in any other manner or place. The production of infertile eggs in hot summer months solves the problem.

WHAT THE LOCAL DEALERS CAN DO.

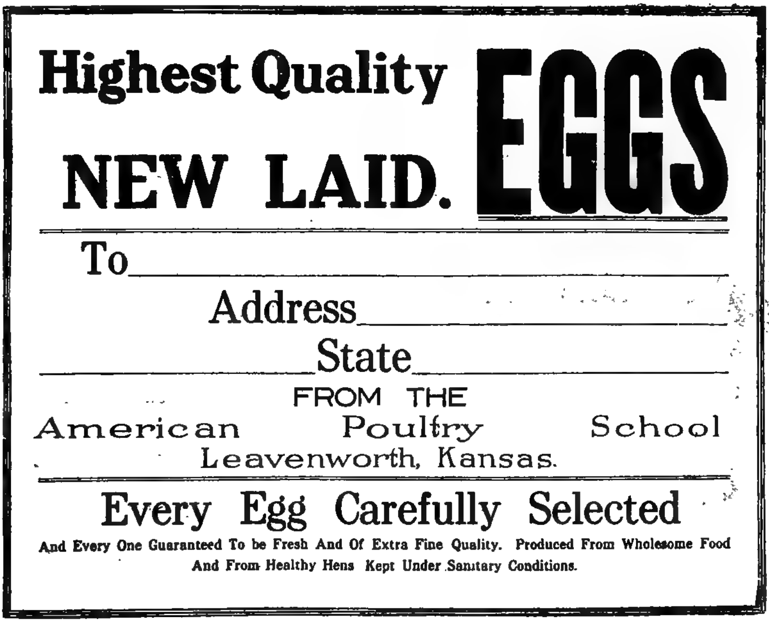
We have discussed at some length some things which the farmer and the producer may do to improve the quality of eggs. But all the blame does not rest with the farmer. If eggs are to reach the market in the best condition and bring the highest price, the country merchant and the local dealer must aid in this movement, which will save millions of dollars each year. We are sure that every up-to-date and progressive merchant and dealer will aid in saving this tremendous waste.

No one who has viewed, at close range, the present system of marketing eggs will assert that it approaches the ideal in any respect. It is antiquated and bunglesome, and results in entirely too wide a margin between the receipts of the producer and the price the ultimate consumer pays.

DEALERS SHOULD BUY ON QUALITY BASIS.

Taking the present system of marketing just as we find it, perhaps the most serious fault is the almost universal practice of buying eggs "case count" the year around. Under this plan "eggs is eggs." Anything with a shell on goes. They all bring the same price, regardless of whether they are little or big, dirty or clean, fresh or rotten. Under this system there is no incentive for the farmer to grade up his stock so as to produce larger eggs, or to market only the fresh and clean ones. Yet, strangely enough, many farmers protest vigorously when some progressive dealer intimates that he does not care to pay good money for bad eggs and that he will hereafter buy "loss-off." By "loss-off" is meant that the eggs are tested when presented for sale, and only those which are good are paid for.

While buying eggs "loss-off" is a far step in advance of buying them "case-count," there is one step further which should be taken in order to give the farmer the necessary incentive to produce large, clean eggs, and to market them as quickly as possible after they are laid. That step is the buying of eggs on a **quality basis**. At a time when eggs were selling in the small country towns of Missouri at 14 cents a dozen the following quotations were running in one of the trade papers covering this territory; Extras, 22 cents; firsts, 20 and 21 cents; seconds, 19 and 19¾ cents; dirties, 17 and 18¾ cents; undergrades, 14 and 17 cents. Had the prices paid to the farmers varied from, say, 12 cents per dozen for undergrades to 16 cents per dozen for firsts, there would be a rapid and remarkable change in the quality of eggs marketed. This system of buying eggs appears to be the solution of the problem, and has proven entirely satisfactory wherever it has been given a thorough and intelligent trial. The U. S. Food Department has forced the buyers and sellers to submit to this method and it is certain to result in higher prices being paid, and a better product produced.



Highest Quality
NEW LAID. EGGS

To________________________________

Address________________________

______________State_______________

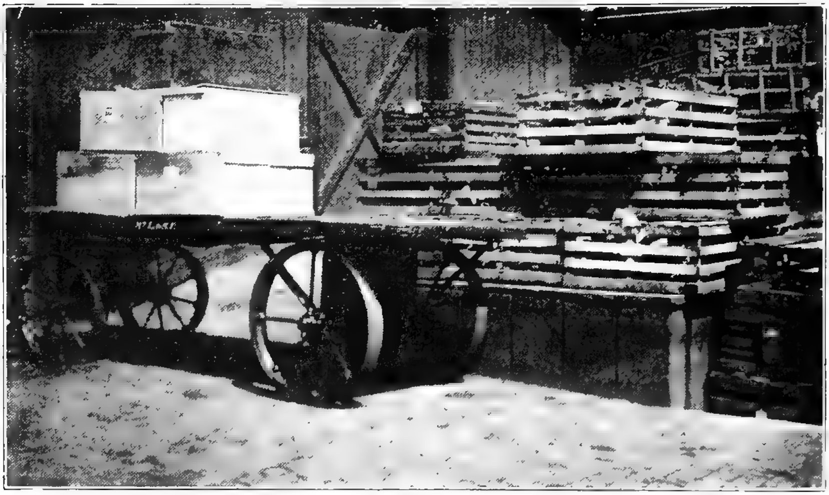
FROM THE
American Poultry School
Leavenworth, Kansas.

Every Egg Carefully Selected

And Every One Guaranteed To be Fresh And Of Extra Fine Quality. Produced From Wholesome Food And From Healthy Hens Kept Under Sanitary Conditions.

All eggs which are sent out from the A. P. S. are sent under this label and under this guarantee. No dealer assumes any risk on eggs purchased under this guarantee. Every consumer gets just what he pays for. This creates confidence in market eggs and encourages greater consumption. Join the "Swat the Rooster" brigade, Mr. and Mrs. Farmer, or Mr. and Mrs. Poultry Raiser.

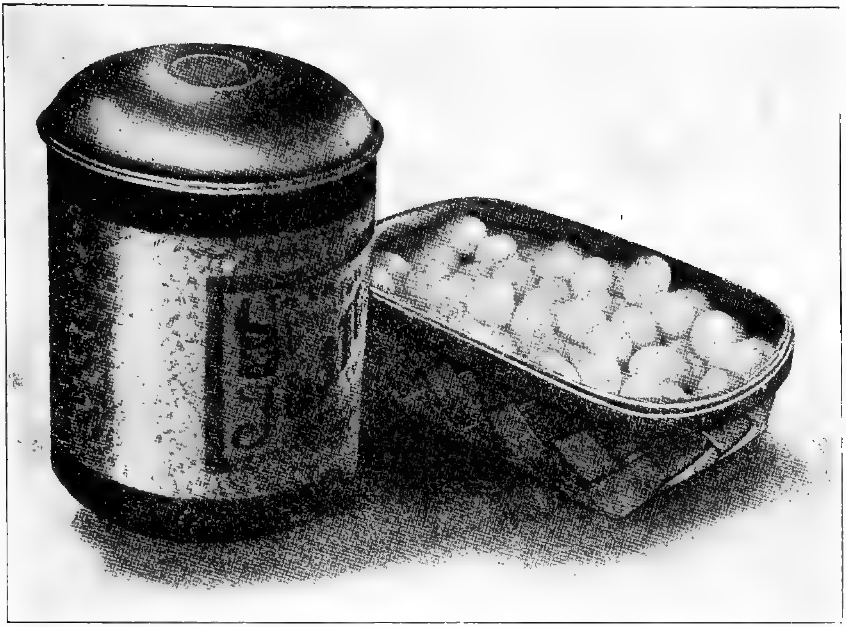
Where dealers pay as much for bad eggs as they do for good eggs, there is absolutely no inducement for farmers to produce a good egg, and they cannot be blamed for bringing to market any old thing with a shell on it so long as the present system is in vogue. It really discourages the production of good eggs. Some country storekeepers actually pay a higher price for eggs than they receive when they in turn sell them. They do this in order to obtain the trade of the farmer, but it is a bad practice. He often loses money in the transaction, but he does it to get the farmer to "take it out in trade," and does not claim to make anything on the eggs he buys, but on the goods he sells. Dealers and merchants who handle eggs in every town should get together and agree to buy on the quality basis only. The merchant and the dealer will then be safe from loss and the producer of good eggs will realize a greater profit, and the producer of bad eggs will suffer a loss because of his carelessness. It is unjust to the man who produces good eggs to compel him to stand the loss and protect the dealer from loss on the one who markets rotten eggs. The egg industry will never reach its greatest possibilities unless the dealers will co-operate in the improvement of the farm egg and pay for just what they buy. Candle the eggs and let the farmer witness the process. We would not want to handle the eggs from any farmer who was so dishonest as to intentionally try to sell a rotten egg. No honest farmer will object to submitting his eggs to the candle test if you permit him to see the operation and he knows you are giving him a square deal.



While the eggs are on the way to market, they are often held on depot platforms in the hot sun which causes them to deteriorate in quality before they reach the consumer.

DELAYS IN MARKETING.

It usually requires a considerable time after the egg is produced to get that egg into the hands of the consumer, especially with the ordinary system of marketing. The farmer usually holds the eggs a week before they are marketed. He delivers them to the groceryman or country merchant, who holds them for a day of two longer, in order to get a good sized shipment. The grocer ships them or delivers them to the nearest dealer, and a day or two is spent en route. Another day or two is added to the age of the egg before they are shipped by the dealer to some commission firm. The jobber then disposes of them to the retailer, who finally sells them to the consumer or the eggs go into cold storage, by which time they are between two and three weeks old. If the eggs are fertile, such delays as this will often start incubation and the egg is rendered unfit for food. **Be prompt in shipments. Avoid delays.**



A serious mistake is often made by placing eggs too near a coal oil can, as they are easily contaminated by close contact with objectionable odors.

PRESERVING EGGS FOR WINTER USE.

It is becoming more and more necessary for both the producer and consumer to hold eggs over from the season of plenty to the season of scarcity, from the season of low prices to the season of high prices. One egg in winter is worth as much as two and perhaps as much as three eggs in the summer time. For that reason it will pay the producer and the consumer to find some method of preserving eggs. Next to cold storage, we have had best success by preserving our eggs in water glass. (Sodium Silicate.) We are also trying out two or three commercial preservatives, and the indications are that they will prove equally as satisfactory. Egg-O.-Lathum sold by Geo. H. Lee Co., of Omaha, Neb., is one of the best that we have used.

You should first prepare your preservative, even before you get the eggs. The water glass solution is made as follows: Use twelve times as much water as you do of the water glass; in other words, to each twelve gallons of water stir in one gallon of the water glass. If you have only a few eggs to preserve, use a smaller quantity, but in this proportion. The water should be boiled and then allowed to cool. When it is just luke warm, you then begin to stir in the water glass. You stir until it is thoroughly mixed. You are now ready for the eggs.

As a container, we use earthen jars, candy buckets, kegs or half barrels. If you use wood see that it is thoroughly cleaned and odorless. The eggs should be fresh and clean. One bad egg may spoil the lot. Place them in the container with the small end of the egg down. Then pour in enough of your solution to cover the top eggs about two inches deep. The following day or just as the eggs are gathered, more eggs can be placed in the same container and more of the solution poured over to cover them. You can continue this process until your container is filled. See that the top layer of eggs is well covered with the solution, and if there is any evaporation the container must be refilled. Cover it over with a heavy cloth and tie it on. Lay a clean board or weight over it to protect same. Place them in a cool place, cellar or basement and they will keep for several months. White eggs preserve as well as brown eggs.

The eggs are good for any purpose, but if you wish to boil them, a small hole should be punctured in the large end of the egg before placing it in the water. In all instances, wash the eggs in water before using.

Any good clean vessel can be used, but it is better to use one of wood, glass or crockery than one of metal. A sweet clean barrel is good, where 50 dozen or more are to be preserved. A clean, cool, sweet cellar is the best place to put the containing vessel.

Use only fresh, clean eggs. If the shell is cracked the egg will always spoil.

All eggs must be completely covered by the water glass as long as they are in storage. If some of the liquid evaporates add more water.

Fertile eggs can be preserved, as well as infertile, if they are perfectly fresh and are stored in a cool place, temperature below 65° F., 33° to 45° F. is best for either.

All eggs for preservation should be clean, gathered often from good clean nests and treated as soon as possible after they are laid.

Lime water and water glass should be quite cold before the eggs are put in. It is best to make fresh preserver for each year.

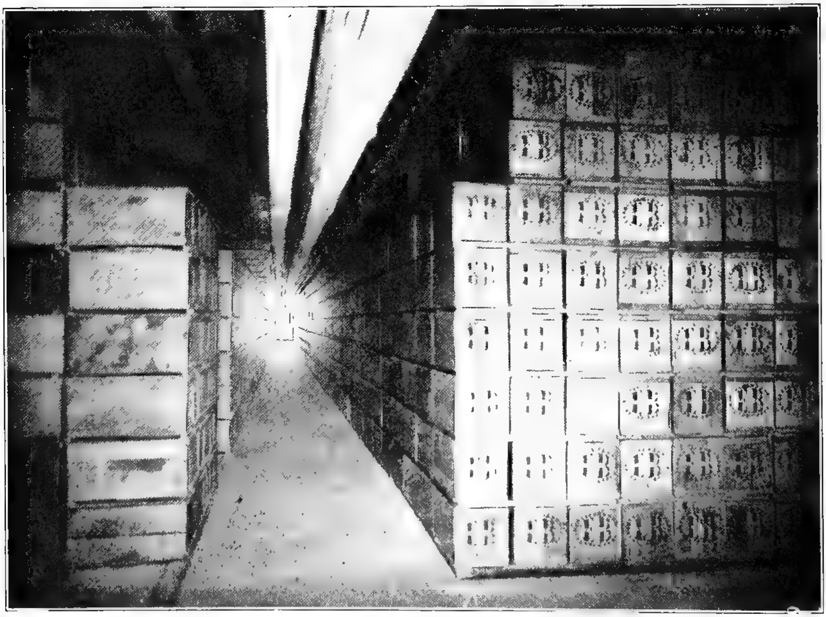
The shells of old eggs are more easily and quickly penetrated by molds and bacteria than those of fresh eggs.

Dirty eggs, or eggs that have been washed, always spoil more readily than clean fresh eggs and should not be preserved by any method.

Only fresh eggs of good quality with good smooth sound shells should be used for preserving.

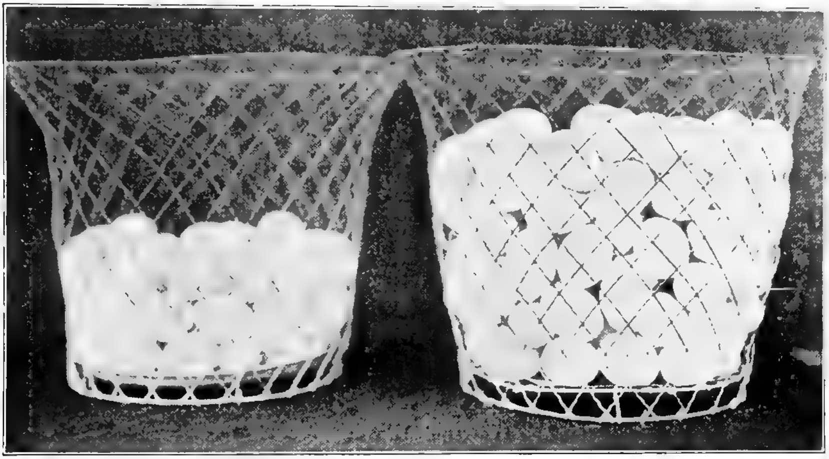
ENCOURAGE COLD STORAGE OF EGGS AND LOCAL COLD STORAGE PLANTS.

Any farmer, consumer or anyone else who is fighting or legislating with a determination to destroy or injure the cold storage of eggs is making a very serious and an almost criminal mistake. Cold storage plants



Millions of dollars worth of eggs in cold storage.

should be regulated, of course, as everything else should be, but if it were not for the cold storage of eggs the poultry business would be absolutely profitless for the farmer or anyone else. A good cold storage egg is much better, even after being in storage for nine months, than are one-half of the supposedly fresh eggs offered for sale on the market. Whenever you deal a death blow to the cold storage plants of this country you also deal a death blow to all branches of the poultry business. Legitimate cold storage plants should be regulated and encouraged. Their destruction would not only injure the poultry business, but would also cripple all other branches of animal industry or horticulture which supply our population with meat, food, fruit and vegetables.

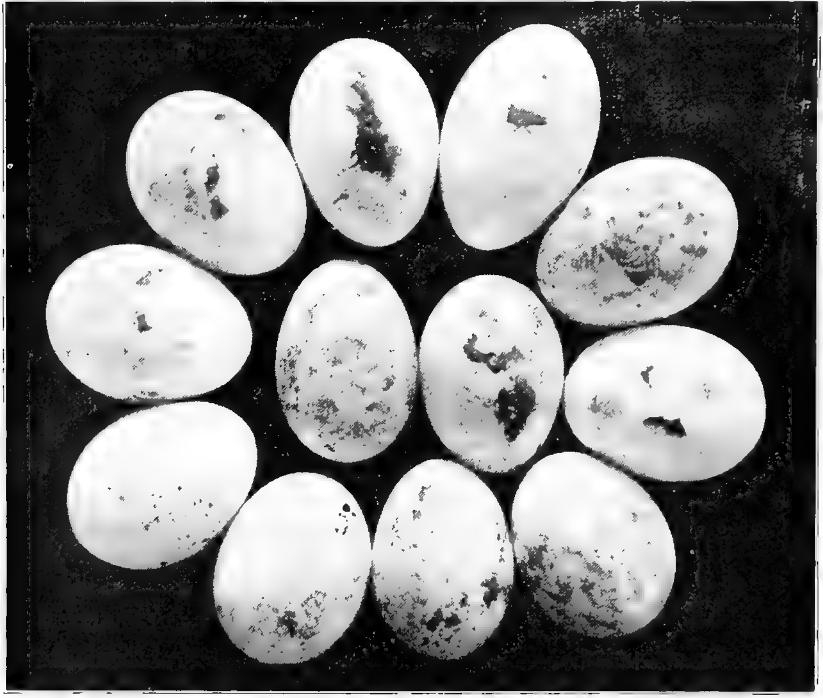


On the left is a basket containing 80 eggs, which is the average yield of the average American farm hen. On the right is a basket containing 150 eggs which should be the average of even ordinary flocks if the right method of selection, breeding, feeding and housing are used. It is possible to double the profit of the average farm flock

The cold storage of eggs prevents the price from becoming extremely high in winter months and extremely low in summer months. An egg of good quality which goes in storage in good condition will come out of storage and be an egg of much higher quality than the average egg which we find upon the open market.

We cannot dispense with the cold storage and packing companies for the reason that during the period of heaviest production vast numbers of eggs are preserved in this manner until the season of scant supply. This acts as a balance wheel and absorbs all surplus at a fair price. The writer can remember, when a boy upon the farm, and before this system was in vogue, to have taken eggs to market during the hot summer months, when the merchants would have boxes and baskets and wash tubs and candy buckets full of eggs sitting here and there in all parts of the store decaying continuously, and they would either refuse to buy your eggs at any price or, perhaps, offer you three to five cents per dozen at most. But at present, during the period of greatest production, the eggs are bought at a reasonable price and placed in cold storage, and are later sold during the period when but few were being produced. If it were not for this method the price of eggs would be ruinously low during the spring and summer months and would be beyond the purchasing power of the average person during the fall and winter months.

The day will come, in my opinion, when we will not only encourage the erection and operation of large cold storage plants in all large cities of this country, but we will also see many cold storage plants built in small towns and at points of production. Enough eggs, fruit and vegetables are wasted upon the farms in practically every community to justify the erection and operation of local cold storage plants. You not only save much which now goes to waste, but you enable the producer to get a better price also. The scarcity of food products of many kinds and our growing population is going to make such a thing possible and eventually absolutely essential. The producer or the consumer who legislates to discourage the cold storage of eggs is unquestionably legislating against his own interests.



By having clean nests, protecting the birds from the droppings by cleaning the boards often or else tacking poultry netting underneath the roost poles, and on damp, rainy days keeping the layers confined to the house until two oclock in the afternoon, dirty eggs can be avoided. Such eggs can be washed and consumed at home or sold locally and not shipped.

SHIPPING EGGS BY PARCEL POST.

A method whereby parcel post shipments of small quantities of eggs, direct from the farm to the consumer should be found so as to increase the popularity of same. We have been shipping eggs from 200 to 300 miles by this method for several months and it has proven quite satisfactory to the shipper and the receiver.

We have shipped several hundred dozen eggs in the container illustrated herewith and we have never had a broken egg. We have containers holding 3 dozen, 6 dozen, 12 dozen and 15 dozen eggs each.

The rate in some cases was a few cents higher than the express rate, but the results were much more satisfactory than express shipments of small quantities to private trade.

The secret of satisfactory shipments is largely in the containers or packages. We have experimented with practically all kinds and find that about 99 per cent of them are impractical and unsatisfactory. The container which we illustrate has proven to be very good and others will be perfected and improved.

It will pay to have the containers returned to you. The consumer should receive credit for the return postage. The return of the containers by the consumer and the postage must be taken into consideration when pricing the eggs.

It will pay to furnish only high class, strictly fresh, infertile eggs. Other people will see and hear of your products, and you can build up a good and profitable business eventually. The only two serious disadvantages in marketing eggs by parcel post are the rates and the containers. The latter will eventually be solved.

The United States Department of Agriculture Bulletin No. 594 has this to say with reference to contract between producer and consumer and parcel post rates:

The nature of the agreement between the producer and the consumer, whether reduced to writing or not, should be made to suit the circumstances and should be fair to both. Perhaps the first agreement made should be in writing; but later, if mutual confidence and trust has been thoroughly established, the contract may be verbal.

Galvanized iron egg carrier for shipment by parcel post. It contains fifteen dozen or a half case of eggs. Such cases as this are certain to come into more common use, and they will enable the producer to place his eggs daily in the hands of the consumer.

The matter of frequency and method of payment can be arranged in various ways. For the first agreement term, which may be a year or less, cash in advance might be satisfactory until a definite system of orders and payments is established.

The agreement should specify:

(1) The names of the parties to the agreement.
(2) The length of time during which the agreement is to be in force.
(3) The number of eggs to be shipped each week during the time contract runs, and also the frequency of shipment and the number in each shipment.
(4) Price to be paid during the time of the contract, together with the base on which the price is fixed.
(5) Method of adjusting claims for broken or bad eggs.
(6) The consumer should open boxes properly (without cutting or tearing), and should take proper care of them and return them by mail as desired by the producer.
(7) Frequency of payment and manner of remitting postage paid on empties returned to the producer to be credited to the consumer on next bill rendered.

For the reason that eggs are in a very abundant supply in the spring season and in very short supply in the fall and early winter season, the contract should specify quantity to be supplied each week throughout the year. The producer cannot expect the consumer to take all the eggs that are to be marketed in the season of greatest production, nor can the consumer expect to get as many eggs as he desires in the season of lowest production; and these two extremes should be thoroughly understood and specifically mentioned in the agreement so as to have no misunderstanding regarding them.

The producer in making an agreement with a consumer should undertake to stand good for eggs that are lost by breaking in shipping. Should this provision in the agreement be abused by any consumer, it might be sufficient reason to refuse to again contract with that consumer, and, of course, satisfactory evidence of unusual breakage would need to be produced, and it might even be necessary to locate the cause of the breakage in the mails.

Particular description is here given of the first and second zones because of the fact that the great bulk of the shipping of farm products by parcel post is likely to be done within these zones. The rate can be ascertained readily from the accompanying tables:

LOCAL PARCEL POST RATES.

Pounds	Postage Cents	Pounds	Postage Cents	Pounds	Postage Cents	Pounds	Postage Cents	Pounds	Postage Cents
1	5	11	10	21	15	31	20	41	25
2	6	12	11	22	16	32	21	42	25
3	6	13	11	23	16	33	21	43	26
4	7	14	12	24	17	34	22	44	27
5	7	15	12	25	17	35	22	45	27
6	8	16	13	26	18	36	23	46	28
7	8	17	13	27	18	37	23	47	28
8	9	18	14	28	19	38	24	48	29
9	9	19	14	29	19	39	24	49	29
10	10	20	15	30	20	40	25	50	30

Fifty pounds is the weight limit for local delivery. These rates are 5 cents for the first pound and one cent additional for each 2 pounds or fraction thereof; they applying to any parcel post matter that does not go beyond the jurisdiction of the mailing office.

FIRST AND SECOND ZONE PARCEL POST RATES.

Pounds	Postage Cents	Pounds	Postage Cents	Pounds	Postage Cents	Pounds	Postage Cents	Pounds	Postage Cents
1	5	11	15	21	25	31	35	41	45
2	6	12	16	22	26	32	36	42	46
3	7	13	17	23	27	33	37	43	47
4	8	14	18	24	28	34	38	44	48
5	9	15	19	25	29	35	39	45	49
6	10	16	20	26	30	36	40	46	50
7	11	17	21	27	31	37	41	47	51
8	12	18	22	28	32	42	48	58	52
9	13	19	23	29	33	39	43	49	53
10	14	20	24	30	34	40	44	50	54

The weight limit within the first and second zones is 50 pounds. These rates apply to all points within the first and second zones, there being no difference in rates between these two zones. A simple rule to determine the postage on any parcel not going beyond the second zone is to add 4 to the number of pounds and the resulting number is the cents postage required. Example: A parcel weighs 13 pounds and 11 ounces; this will require postage on 14 pounds (as any fraction of a pound is considered a full pound); 14 plus 4 equals 18 cents postage.

The weight limit for the third, fourth, fifth, sixth, seventh and eighth zones is 20 pounds. Any information desired as to rates, zones and the like can be obtained from any post office.

DISADVANTAGES OR DIFFICULTIES IN MARKETING EGGS BY PARCEL POST.

If it is kept in mind that it takes a few days for eggs to reach the consumer, a regular supply of eggs can be had for use at all times. The possibility of broken eggs and the consequent adjustment of payment may seem to be a disadvantage, but if properly provided for in the agreement it need not be. The matter of arriving at equitable prices may seem to be difficult, but ought not be a drawback.

Some farmers may be so situated that they already have a satisfactory market for their eggs. Others may wish to have a parcel post market during a part of the year, but may dispose of them otherwise during the remainder of the year. The local market may also at times afford a more satisfactory price than that received under a parcel post selling agreement. There may also be producers of large quantities of eggs who find express transportation cheaper than parcel post.

The securing of proper containers and the wrapping and packing of the eggs properly for mailing, as well as the care that needs to be exercised in shipping only strictly first class eggs, may seem difficult to some, but if a parcel post market is to be developed, it will require care and attention to get it properly established and to keep it going successfully.

Whether the marketing of eggs by parcel post should be attempted by any particular producer will depend on his present available markets, the possibility of securing a satisfactory customer or customers, and the care taken to follow tested and approved methods in preparing the eggs for shipment. Failure in attempting to ship eggs by parcel post have resutled because proper precaution as to package or container, packing and labeling were not observed.

EXHIBITING AND JUDGING EGGS.

All poultry show officers, egg dealers, breeders, farmers and others who are interested in good eggs should encourage the exhibition of eggs at poultry shows, county fairs and similar public exhibitions. Everyone knows more or less about eggs, and there are few who do not appreciate an exhibit of clean, fresh eggs. An exhibition of this kind helps to interest everyone in the hen and in poultry in general.

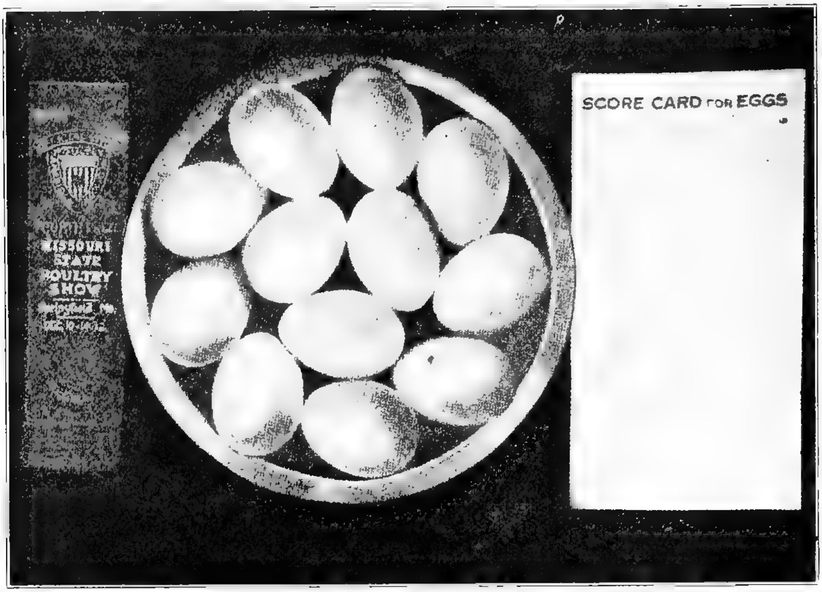
Poultry show associations would do well to include a class for eggs in their premium lists. Nothing about the show will attract more attention than a well arranged display of fresh eggs from different varieties of poultry.

In arranging classes for eggs and in judging them one breed should not be compelled to compete against another—that is, Plymouth Rock eggs should compete against Plymouth Rocks, Wyandottes against Wyandottes, Leghorns against Leghorns, and so on. If you want the breeds to compete against each other, it should be only for sweepstake prizes.

One of the best methods of displaying eggs is in paper boxes or paper box lids one inch deep and 7x10 inches in size. Place bran in the box to hold the eggs in position. Arrange all eggs so that the small ends of the eggs all point in the same direction, preferably toward you as you look at the exhibit. If the square boxes cannot be secured, then paper or wooden pie plates of the proper size will answer. The plates should be sufficiently large so that they will hold one dozen eggs without piling them up. In this case, put three eggs in the center and point all the small ends of the remainder of the eggs to the center of the plate. Cover the table on which the eggs are to be shown with a dark green cloth and place the display boxes or plates of eggs on this and you have a most attractive exhibit.

The eggs should be shown in dozens and there should be a card on each dozen to show the variety it represents. The following score card and explanation of score card was patterned somewhat after the score card for eggs recommended by the poultry department of Purdue University. Theirs was improved and rearranged to meet our ideas as to what the card should really be.

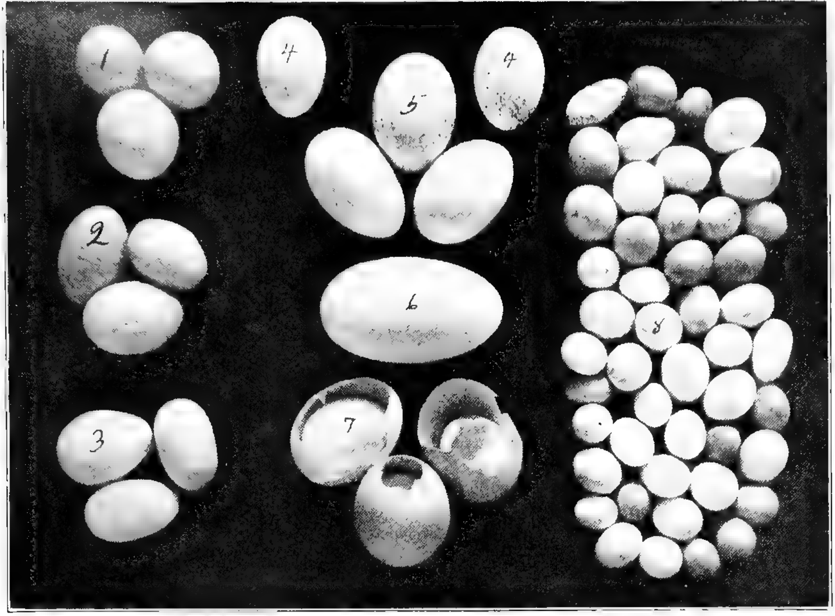
The American Poultry Association has just adopted a standard for market poultry and eggs. It has also been approved by the National Car Lot Shippers Association. They have a standard score card and these can be secured from the secretary of the association, and we recommend their use.



A method of displaying eggs at a poultry exhibition or an egg show so that the visitors may see the eggs themselves, the variety, the score and the premium won.

The exhibition of high quality eggs should be encouraged. It will have a tendency to create an interest in the production of high quality eggs, it will help to increase the uniformity in size, shape and color, and will aid in restoring confidence in market eggs in the mind of the consumer.

Prof. Quisenberry giving a demonstration in the selection and grading of market eggs. Audiences of several thousand farmers and poultry raisers witnessed these demonstrations.



These eggs show the variations in size and shape of eggs laid by a single flock in a single month. This shows the necessity for careful selection and culling. No. 1 are perfectly round eggs. No. 2 are eggs with very rough shells. No. 3 are long pointed eggs. No. 4 are normal eggs of correct size and shape. No. 5 contain double yolks. No. 6 contains triple yolks. No. 7 shows three eggs of normal size on the inside of very large eggs. No. 8 are very small eggs, not fit for market.

SCORE CARD FOR EGGS

furnished by the
Missouri State Poultry Experiment Station
Mountain Grove, Mo.

Show ....
Exhibitor ....
Variety ....
Entry No. ....

Date ....
Address ....
Color ....
Weight ....Oz. ......

	Standard points	Cuts	Remarks
Weight	20	....	....
Shape	5	....	....
Uniformity of size and shape	5	....	....
Cleanliness of shell	10	....	....
Shell texture	10	....	....
Uniformity of color	5	....	....
Points determined by candling	......	....	....
Size of air cell	15	....	....
Quality of White	10	....	....
Quality of yolk	20	....	....
Totals	100	....	Score ....

....Judge

......................................Secretary

The following information and explanation is printed on the back of each score card:

INSTRUCTIONS TO JUDGES

An egg-candling device should be provided for each egg show, but in case there is none the judge should use his best judgment and score them according to exterior conditions and appearances. In this case, he should also break the most doubtful egg in each dozen into a pan or saucer and then judge of its freshness or quality.

EXPLANATIONS OF POINTS ON THE SCORE CARD.

Weight.—Commercial eggs that are desirable are classed as **extras** and **firsts**. One dozen extras must weigh 26-28 ounces, firsts, 24-26 ounces. One point cut is allowed for each ounce or fraction of an ounce over or under the required weight of either class. Overweight cuts of firsts are necessary because eggs over 26 ounces belong in the extra class, and extras over 28 ounces are too large for shipment in ordinary egg cases and are in reality abnormal eggs. The size of eggs has a commercial value, and breeds producing very small eggs should not be used or encouraged.

Shape.—Each egg must conform as much as possible to the desired shape. A properly shaped egg should be ablong-spherical, slightly tapering towards one end.

Uniformity of size and shape.—Uniformity largely controls appearance and all eggs must be the same size. Small or large eggs are not classed as first grade. All eggs should be the same shape.

Clealiness of shell.—Free from dirt or stain and unwashed.

Shell texture.—Free from wrinkles, rough places, but more especially weak spots and cracks. One cracked egg should cut the dozen its full allowance for shell texture.

Uniformity of color.—If white, eggs should be all pure white and not tinted. If brown, the color may be any shade, but the dozen should be uniformly the same color.

Size of air cell.—Test with candler. When the shell is first placed around an egg its contents entirely fill the shell. As the egg grows older evaporation takes place, and the size of the air cell in the large end of the egg indicates whether it is a fresh, held or stale egg. Cut this section if the air cell is larger than a dime.

Quality of white and yolk.—Test with candler. Eggs must appear opaque, the yolks free from spots, blood rings, or dark color. White, thick and yolk barely visible. Large air cells, floating yolks or air cells are defects. Eggs must be fresh and sweet, and bear every evidence of being an egg of high quality.

Disqualifications.—The presence of more than one cracked egg; or an egg which is leaking; extremely irregular; very dirty; signs of being washed; evidences of fertility, incubation, or decomposition, or one musty egg in a dozen will disqualify the exhibit.

How to Cut.—Cut one point for each ounce the dozen eggs may be overweight or underweight. For other defects, found in any section of the score card, cut from one-half to the full value of that section, depending upon the seriousness of the defect. In determining the value of an egg, uniformity, size and color must be made secondary to that of the quality of the eggs themselves.

CO-OPERATIVE EGG MARKETING ASSOCIATIONS.

In some states and in some localities associations of farmers and poultry raisers have been organized for selling the produce of the farm. The general idea is to produce larger and better eggs and market them in a systematic way. They gather the eggs twice a day and keep them clean, sort them, and throw out all under or over sized eggs and pack them for market. The white eggs and brown ones are packed separately. All unattractive and dirty eggs are discarded, so far as the market is concerned. The eggs are shipped direct from the producer to the city grocer or consumer, or sold through a local dealer. A guarantee of the facts is set forth on the carton or case concerning their quality, with a statement that any egg found defective in any way will be replaced free of charge. Such eggs bring more than those marketed in the ordinary hit-or-miss manner. Fresh candled eggs are usually from two to five cents per dozen higher on the market than the ordinary run of eggs, and it will pay the farmers to organize themselves into local poultry associations for the purpose of marketing their poultry products in the manner suggested above, and whether you ship direct to the consumer in some city or whether you sell to your local poultry dealer, it will pay you to use some care in preparing and marketing your poultry and eggs.

A homemade egg candle, made by placing an ordinary paper box around a lighted lamp with a hole cut in the bottom of the box. When eggs are held before this candle in a dark room, you can easily distinguish the good from the bad. An electric light bulb can be placed inside this same box if the current is available.

The first "egg-circle" or co-operative egg-marketing association in Missouri was organized under the name "Dent County Co-operative Egg and Poultry Marketing Association." There are twenty-five charter members.

The membership fee is $1, and the money so collected is used to buy each member a rubber stamp to stamp his number on the large end of every egg he sells through the organization, so that each member stands responsible for his own eggs. This left enough money from the membership fees to buy a number of egg cases and cartons for shipping the eggs.

MANAGER CANDLES EGGS.

A receiving station is located in Salem, and the manager candles every egg before packing, to be sure that nothing but strictly first class eggs are marketed. The eggs are sorted as to size and color

The organization adopted a trade name, and every egg and fowl sent out by the association will carry that name. The association is trying to obtain a number of suitable egg-mailing cases for the use of farmers living along the five rural delivery routes and the several star mail routes which start from Salem, so that the fresh-laid eggs can be delivered at the receiving station daily.

It will be cheaper for the farmers to pay the parcel post rates on the eggs in the local zone than to hitch up and haul them to town, and the mail carriers can haul mail out and haul eggs back. The association manager will keep account of the number of eggs delivered by each member, who will receive market prices on delivery, and at the end of each month the expenses of operating the receiving station will be taken out of the profits and the balance divided among the members.

GOOD EGGS IN DEMAND.

The association has already received offers for all the eggs they can supply and they do not anticipate having any trouble in disposing of their supply. The poultry products shipped out of Dent county in one year amounted to $250,000, so this organization has prospects of handling a large amount of money in the course of a year, and they expect to nearly double the amount by handling only first quality eggs at a better price than formerly has been paid for farm-run eggs.

The members will hold meetings at stated intervals to discuss conditions and to post themselves on the needs of the fancy markets, so they can take advantage of same by producing poultry and eggs to fill these requirements.

Such associations are not only beneficial and instrumental in improving the quality of the eggs marketed in that particular locality, but they also enable the farmers to co-operate in the buying of feed, incubators, poultry appliances, and in the production of poultry, incubation, etc., and in the buying of stock or eggs to improve the flocks owned by association members. They can have monthly or occasional meetings to discuss poultry problems in general.

Such associations can usually make satisfactory arrangements with their local dealers or with some commission firm or jobber to handle the entire output of eggs.

The trouble with practically all such organizations is the fact that most farmers will not stand by their organizations. It takes quite a campaign of education and work to insure the success of these organizations. Outside forces may try to disrupt such organizations, and it requires a lot of work and very little pay for the officers who have the work in charge at the beginning. Some members will become offended if you cull out about one-third of their eggs, and others will quit "if that's the way you are going to do business."

It is necessary for those in charge of the work to sort and grade the eggs carefully, but at the same time be reasonable and kind in dealing with the members and explain to them the importance and necessity for buying on the quality basis. Use good judgment and tact, and by all means the co-operative association must stand for quality in its product.

Every member of such an organization should do everything within his power to support and build up the association.

Every member must be loyal if the organization is to succeed. Strive to make your association the best, and always bear in mind that the reputation and success of co-operative associations depend upon the quality of their products.

NEW ENGLAND POULTRY PRODUCERS' EXCHANGE.

In California, New England and other sections of this country co-operative producing and marketing associations have been formed. This is one of the solutions of successful and profitable poultry farming. Some good poultrymen who gave serious thought to the problems of marketing, formed a New England Poultry Producers' Exchange. It might be to your advantage to know about their purposes, aims and plan of co-operation.

Theodore Roosevelt, in addressing the farmers of New England at a meeting in Springfield, Mass., on May first, said:

"If the farmers of today don't adopt the resources of modern science and modern business, they can't hold their own in the world of today. If the farmer leaves it to the business man to organize, if he leaves it with the wide-a-wake worker of the great cities to organize, then he will go down. Unorganized man under modern conditions cannot stand by himself, hold his own against his fellows who organize. **And I think myself that the duty of organization is even more important than the duty of taking advantage of modern scientific methods, important though it is to take advantage of these methods.**

"He must do both of those things, he must learn to co-operate, then having learned those things he has got to remember that if he doesn't show the old time qualities of honesty, of steadfastness, of power to work hard, of desire to live cleanly, he will go down and will deserve to go down.

"If a farmer always sells at wholesale prices and purchases at retail prices, he won't make a success of his farm and you don't have to be a very acute business man to know this, and he is bound to do just exactly that unless he will organize. He must organize with the business man—not so as to hurt the business man any more than the business man should organize to hurt him, but for their mutual benefit; organize so as to make the community consisting of themselves jointly more prosperous—not less prosperous, but more prosperous—and then try to see that the prosperity is passed around with reasonable equity. I say reasonable equity because I think the millenium is some way off and whenever you meet a man who will promise you perfection the one thing you can be sure of is that you won't get it, and that is the one thing you can be positively sure of; you can be reasonably sure that if he is intelligent he is not straight and that if he is not a crook, he is not intelligent, but you can be perfectly sure that you won't get what he says you will if he promises you the millenium, and I think it is always a great mistake—I have never agreed with those people who say that you hearten a man up by promises of what he isn't going to get.

"I don't think it works well even with children. You see I speak as a qualified grandfather. My experience is that if you promise a child something that you aren't quite able to deliver, after a while you justly shake that child's confidence in you and the fact that his confidence is shaken shows that he is wiser than some men. Let's promise only what we can perform, but **let us avoid rotting in that pit of stagnation in which those rot who think that thev can't make the world a little better."**

OBJECTS OF THIS EXCHANGE.

The New England Poultry Producers' Exchange aims to help producers of poultry products in all sections of New England by uniting for their mutual advantage all branches of the poultry industry, including egg production, poultry for meat, day-old chick business and the breeder or fancier of poultry. Each of these branches of the business will naturally have its difficult problems. Different sections will also have their problems, all of which will be handled through committees having representatives of these different branches of the business, who will be familiar with the actual needs and conditions.

Committees on various phases of the work have already been appointed. A committee on co-operative buying will arrange for securing and distributing quotations on grains and feedstuffs to the members, endeavoring to mass the buying power of a large membership so that the lowest possible prices may be secured in buying a large quantity.

The Legislative Committee, which includes a member from each State, will work to the best interest of the members in effecting legislation to their advantage, and will actively serve the members by making protest against such rules and regulations of the State and Federal government which might prove detrimental to the best interests of the poultry industry. It will be the aim of this committee to secure legislation which will bring about uniform grades and standards for the six New England States.

A Committee on Transportation will deal with the railroad and freight agencies, endeavoring to secure quicker and better service for the handling of poultry products, thereby reducing the present losses incurred by rough handling, also to aid in the collection of claims for such losses. This committee will endeavor to secure such rulings as will permit the poultry producers of New England to buy their supplies further in advance so that our members might be assured of a supply of grain during any railroad tie-up in succeeding winters.

A Committee on Marketing will arrange for the proper handling of the products on the markets of the different cities where they will be sold. If the membership campaign brings a large return and there is assurance of a large volume of business, an establishment will be opened in Boston for the sale of the products of the members. As soon as this business is placed on a paying basis, the business of the Exchange will be extended to another city or cities. The Marketing Committee will make arrangements for handling the products whether through a place controlled by the Exchange or through commission merchants.

A Committee on Publicity and Advertising will aid the work of all other committees and will plan the campaign of advertising to educate the consuming public to the value of New England poultry products. A trademark has been designed by this committee which will appear on the best grades and the consumer's attention will be drawn to the guarantee of quality for which this mark stands.

CO-OPERATIVE BUYING.

In the work of co-operative buying quotations will be sought from the most reliable sources and furnished to local affiliated organizations. This work will be handled in co-operation with the Eastern State Farmers' Exchange and through the members of that Exchange elected from this organization, special attention will be given to the needs of the poultry producers. As the business in co-operative buying develops it is intended to furnish quotations at frequent intervals. In the beginning the plan of weekly quotations will be followed.

Every poultryman recognizes the fact that his cost of production reduced a few cents per year on every bird will result in an attractive saving or increase of profit. The very conservative statement of a government official places the saving of the past year in co-operative organization work in the Northern and Western States at twelve per cent. This would practically amount to an added profit of thitry-six cents on every bird in your flock and would represent a sufficient increase in your profits for the year to encourage further production.

Where co-operative buying is being carried on in New England today the savings are ranging from One Dollar to Ten Dollars and in some instances more on a single ton of feed stuffs. It would be reasonably safe to say that in New England a saving of fifteen per cent is being effected through co-operative buying, and these facilities for buying at the wholesale price will be at the disposal of members in the New England Poutlry Producers' Exchange.

LEGISLATIVE PLANS.

If the poultry business is to be placed on a sound basis we must have laws to protect and govern the handling and sale of our products. Other industries are organized in such manner that they actively oppose any bill or proposed legislation which might prove detrimental to their business. Many persons have thought it impracticable to establish grades and standards by law. Canada has just enacted laws governing the marketing of eggs, which we believe will prove of great benefit to producers in the Dominion. We want to watch the application and operation of these laws and secure the enactment of similar laws for the betterment of the poultry industry in New England.

TRANSPORTATION PROBLEMS.

Lack of transportation facilities or unbusinesslike methods and rough handling of egg cases and other packages containing poultry products, together with arbitrary express rulings have resulted in a loss of thousands of dollars to the poultrymen of New England. The New England Poultry Producers' Exchange is planning to put a committee to work on these problems with the proper authorities to see if some relief cannot be obtained at once from the tremendous egg breakage and that hatching eggs receive better care next winter and spring. A strong appeal will be made to the government to allow our New England poultrymen to stock up on feeds to assure an adequate supply during the winter months so that transportation difficulties will not hamper our business so seriously.

PRESENT MARKETING PLAN.

A plan for marketing which has been proposed will be to concentrate for the present in the sale of products on the Boston market. At the present time, Boston consumes an average of from 30,000 to 35,000 cases of eggs per week, only 10% of which are produced within New England.

New England shippers are placing their products on practically every market within the six New England States. This method is economical from the standpoint of the transportation cost and will no doubt be continued by some shippers. To mass the volume of products of the members joining the New England Poultry Producers' Exchange so that they might be graded and trade marked in a central receiving station in Boston, will mean that there will be one fixed and established standard; it will mean that instead of every farmer grading his own products that there will be one distinct grade and the entire supply will be graded and packed under the supervision of one inspector. It will further provide for a concentrated publicity program so that instead of marketing products over a half dozen markets of New England and staging a campaign in each of these cities, the campaign will be placed through the newspapers in the city of Boston, where there is sufficient demand for the products and where a reasonable return might be expected. Just as soon as the business is in a substantial condition in Boston, there will be developed branches in the larger New England cities.

Producers with a small number of birds will arrange for the regular collection of the eggs in their community and ship them to the Boston store. Community gathering of eggs would insure the products being placed on the market promptly and enable the small producer to receive equal benefits and prices as the largest producers. The small producer with his supply will be a great factor in swelling the total business and his shipments will receive equal attention and care as the shipments from the larger producers.

This manner of marketing furnishes a sure outlet for the products of its members. All of your shipments would not bear a trade mark name but simply those which meet the standards of the Exchange. The shipments will be received at the store of the Exchange in Boston and there graded and a rating given on which basis payment will be made to the shipper. The higher grades will be marketed under the trade mark name of the Exchange and the lower grades will be sold without mark of identification.

POSSIBILITIES IN ADVERTISING.

The possibilities of such an organization are tremendous when the study of conditions reveals that only **20% of the poultry products consumed in New England are produced within its borders and that less than 10% of the poultry products sold on the Boston market are produced within the New England States. There are more than $25,000,000 worth of poultry products shipped into New England each year,** from Illinois, Missouri, California and some from as far as China. We have the best markets of the world literally at our door and because we lack organization shippers of the Middle and Far West are taking advantage of these markets through their organized business methods. There is a preference expressed by the consumer for hennery eggs, but the great majority of those who in buying ask for fresh eggs, receive Western eggs which have been in transit in many cases from three to six weeks. During the past winter many cases were shipped into Boston containing eggs that had been in transit three months from the Middle West and many of these were sold to consumers as fresh eggs.

One of the biggest possibilities before the New England Poultry Producers' organization is to enable the people to identify the locally produced eggs so that when they ask for them on the market, by means of a trade mark name they will be able to secure New England eggs and be sure that they are receiving what they pay for.

We have planned a publicity campaign to be run in the Boston papers, advocating a greater use of New England poultry products, telling the consumers about their superior quality, of their freshness, etc. This will be followed by a campaign to advertise our "Diamond Brand" products. An appropriation of $1,000 has already been made by the organization for this purpose.

In advertising any product it is necessary to have a reliable and substantial supply of that product, otherwise a demand is created which goes beyond the amount which the advertiser is able to furnish. There is not one nor a half dozen producers of poultry products in New England who have sufficient volume of business to warrant conducting an extensive advertising campaign. This expenditure would be too great in comparison with the volume of business and the demand created would go beyond the possible supply.

Through co-operation it is possible for the members of the exchange to furnish a constant supply which will meet the demand created by our organized advertising. It will mean that the supply will be sufficient to meet the demands of the trade even in the slack season; under present conditions, it is in the slack season that the Western eggs control the prices of fresh eggs.

NATURE OF ORGANIZATION.

There is no capital stock in the New England Poultry Producers' Exchange and it is strictly a non-profit organization. Provision is made in the by-laws that the savings shall be returned pro-rated according to the volume of business recorded on the books of the Exchange for the individual members. No one will be entitled to membership except those who are commercial poultry producers and to each of such members one vote will be allowed at the annual meeting. Provision is made whereby the Exchange shall have control of the poultry and poultry products of every member unless such member gives notice in writing to the Exchange between January 1st and 15th of any year that he will withdraw a specific portion or the entire output from the Exchange for the ensuing year. The reason for such control is self evident. Unless the management was sure of the volume to be handled in one year it would be impossible to know how extensive an organization would be required to handle the products and to what extent it would be necessary to advertise and stimulate the demand. This provision is to the best interest of the members and it allows them to withdraw any or all of their products for the year provided they make the same known in writing to the Exchange before January 15th of any year. The strength of the business will depend upon the amount of high grade products handled by the Exchange and there will be no desire to secure volumes of inferior grades out of proportion to the quantity of the first class products handled.

MANAGEMENT AND DIRECTION.

From the membership of the Exchange there is annually elected a Board of Directors of not less than nine. Local organizations identified with the Exchange that have at least ten members who are identified with the New England Poultry Producers' Exchange will have the privilege of nominating one director whose name will be presented for election at the annual meeting. From the Board of Directors there shall be chosen annually not less than five who together with the president constitute the Executive Committee. Serving under the direction of the officers and the Executive Committee there is a manager in charge of the detail work of operating and managing the Exchange.

In the plan for co-operative selling the equitable distribution of products offered for sale will be in charge of the Exchange Manager as well as general work of advertising and promoting consumption of Exchange products. The New England Poultry Producers' Exchange is affiliated with the Eastern States Farmers' Exchange and will utilize the facilities of that organization and also participate in its management through representatives elected by the Executive Committee. State and local poultry associations are invited to identify themselves with the New England Poultry Producers' Exchange and on securing the required number of members will be entitled to nominate a member for the Board of Directors of the Exchange.

The operation of the Exchange will be carried on a cost basis and if the charge made in the beginning is greater than the expenses of operation the savings will be returned pro-rated according to the volume of business handled for the individual members of the Exchange.

Does such an association as outlined in the above statements meet the wishes and needs of your particular business? The aim of the Exchange is to better conditions through co-operation by providing New England products with a market through organized channels; by establishing a permanent asset in the form of a trade mark; by correcting trade abuses which exist at the present time; by keeping in touch with legislative matters affecting their business, and meeting organized competition of the Western farmers, and by reducing the cost of production by means of co-operative buying.

ARTICLE I.

Name.

This Association shall be known as the New England Poultry Producers' Exchange. The principal office of the Exchange shall be located in the State of Massachusetts, City of Boston.

ARTICLE II.

Objects.

The objects of this Exchange are:

1. To conserve and promote the poultry interests of New England.
2. To encourage, introduce and apply improved business methods in poultyr culture and to promote co-operation with State, County and local organizations in New England which are engaged in the work of developing poultry producers' interests, especially those concerned in co-operative buying or manufacturing of supplies and in the distribution of products.
3. To furnish adequate and reliable information regarding the industry to enable them to act intelligently and safeguard their interests.
4. To secure efficient economical and uniform methods in grading, packing, transporting, marketing and advertising of poultry and poultry products.
5. To rent, buy, build, own, sell and control such building, and other real and personal property as may be needed in the conduct of its operations.
6. To protest against rules and regulations detrimental to our interests and to suggest from time to time rules to regulate abusive practices in handling supplies necessary in our business.
7. To affiliate with the Eastern States Farmers' Exchange in the purchase of its supplies and marketing of its products and to avail itself of the facilities of the Eastern States Farmers' Exchange and participate in its management through such representation as may be authoirzed by the Executive Committee of the New England Poultry Producers' Exchange and by the Executive Committee of the Eastern States Farmers' Exchange.
8. To do business at cost for the benefit of its members.
9. To do any and all things necessary or convenient in promoting the interests of the members of the corporation.

ARTICLE III

Nature of the Organization

The New England Poultry Producers' Exchange shall have no capital stock, but the necessary funds for operation shall be provided as stitpulated in these by-laws, and in such manner as the directors shall determine or may arrange. It shall conduct business for the mutual help of its members and without profit.

ARTICLE IV.

Membership.

Section 1. The membership of the New England Poultry Producers' Exchange shall be composed of commercial poultry producers, and a member of any local association whose object may be the promotion of Poultry interests, and who shall be represented on the board of directors by one member elected by the local association.

Section 2. A certificate of membership shall be issued to each member hereunder who shall have one vote, except when any member present shall call for a vote according to the size of the flock, when each member shall have one additional vote for every hundred head of mature stock as specified in his receipt for dues for the current year.

Section 3. Certificates of membership shall not be transferred so as to confer upon the transferee any voting power, property right or interest in this corporation, except when transferred in connection with the bona fide sale or lease of the member's poultry farm to the transferee.

ARTICLE V.

Fees and Dues.

Section 1. The membership fee shall be $5.00, payable in advance.

Section 2. The annual dues of this Exchange shall be one cent per head of mature stock, the count being taken January 1st preceding the annual meeting, with a minimum of $1.00, payable on or before the date of the annual meeting.

ARTICLE VI.

Officers and Their Election.

Section 1. The officers of the corporation, who shall be selected from the membership thereof, shall be a President, two Vice-Presidents, a Clerk, Treasurer, and not less than nine Directors, all of whom shall be elected by ballot, and shall hold office until the next annual meeting, and until their successors are duly chosen and qualified. The Clerk, Treasurer and the Directors shall be chosen at the annual meeting or at any meeting held in lieu thereof. Additional Directors may be chosen by ballot at any special meeting of the corporation.

Section 2. Immediately after the election of the Directors at the annual meeting, or special meeting held in lieu thereof, the newly elected Board of Directors shall meet and elect from their own number a President and two Vice-Presidents. No notice of such meeting shall be necessary.

ARTICLE VII.

Board of Directors.

When ten or more commercial poultry producers, members of a local organization, are members of this Exchange, such local organization shall be entitled to one representative upon the Board of Directors of this Exchange. Such representative, who shall be a commercial poultry raiser, and a member of this corporation, shall be nominated by such local organization, and shall bcome a member of the Board of Directors of this corporation upon election by ballot at any general or special meeting thereof.

The Board of Directors shall have the general management, control and direction of all the business and affairs of the Exchange, and of all the trusts and undertakings, with full power to make all investments and to transfer all real and personal property belonging to or in charge or control of the Exchange.

The Board of Directors may pass such votes as they deem for the best interests of the Exchange. The Executive Committee shall act in accordance with such votes and shall at all times be subject to the control of the Board of Directors.

The Directors may authorize the President or Treasurer, at any time, to sign, execute and acknowledge any deed of real estate or lease or any instrument in writing, as they may see fit. The Directors shall have power to determine upon the form of certificate of membership and of the transfer thereof, and upon a corporate seal; to make further rules and regulations for their own government and the transaction of business not inconsistent with these by-laws.

The board of Directors shall prescribe the duties of the officers of the Exchange, fix their salaries, and require satisfactory bonds from the Treasurer and from other officers and agents of the Company as they see fit. The Board of Directors may delegate any of these powers to the Executive Committee, to be chosen as hereinafter provided, which committee shall be at all times subject to the control of the Board of Directors.

There shall be a meeting of the Board of Directors for the transaction of business quarterly, and as much oftener as may be found necessary or upon the call of the President or five Directors. Five Directors shall constitute a quorum for the transaction of business.

Any vacancy occurring in the intervals between annual meetings, by death, resignation, disqualification, inability or otherwise, may be filled by the remaining directors.

ARTICLE VIII.

Duties of Officers.

President.

Section 1. The President shall preside at all meetings of the members and of the Directors. If not present, one of the Vice-Presidents shall preside.

Sec. 2. The President shall perform all other duties incident to his office or prescribed by a vote of the members of the Exchange or of the Directors. He shall be an ex-officio member of every committee of the Exchange, and shall exercise such general direction and supervision of the business of the Exchange as its interests and security may require.

ARTICLE IX.

Vice-President.

The Vice-Presidents shall be vested with all the powers and shall perform all the duties of the President in his absence or disability.

ARTICLE X.

Treasurer.

The Treasurer shall receive and disburse all moneys of the Exchange, shall keep accurate accounts of all financial transactions of the Exchange, which shall always be open to the inspection of the Directors. He shall sign in behalf of the Exchange all commercial paper, and shall perform such other duties as shall from time to time be prescribed by the Directors. In the absence or disability of the Treasurer, the Executive Committee may designate some person with power to act in his stead. The Treasurer shall give bond to be approved by the Board for the faithful performance of his duties and to insure the Exchange against financial loss, the cost of the bond to be paid by the Exchange. At the expiration of his term of office he shall immediately deliver to his successor all moneys, property, books, memoranda, records and all writings and documents pertaining to the office of Treasurer or belonging to the Exchange.

ARTICLE XI.

Clerk.

The Clerk shall keep correct records of all the meetings of the members and directors, and shall give notice of all such meetings, and shall be sworn to the faithful and impartial performance of his duties. At the expiration of his term of office he shall immediately deliver to his successor all books, records, memoranda and all property or documents of value or pertaining to the office of clerk or belonging to the Exchange.

ARTICLE XII.

Executive Committee.

The Board of Directors shall annually elect not less than five of its number, who, with the President, shall constitute the Executive Committee. The Committee shall elect their own chairman. The Executive Committee shall meet as often as the business of the Exchange may require. They shall keep a record of their proceedings.

It shall be the duty of the Committee to exercise a careful supervision of all the business affairs of the Exchange, and of all trusts held by it, if any.

The Executive Committee shall have power when the Board of Directors is not in session to transact all business for and in behalf of the

Exchange, and to give the necessary instructions to the executive officers in their behalf; and to authorize the officers to execute and affix the corporate seal to any contracts or instruments in writing

The Executive Committee may advise and superintend all investments that shall be made of the funds of the Exchange in stock, personal securities and bonds and mortgages and may direct the disposal of the same.

The Executive Committee may authorize the President or Treasurer to negotiate collateral or other loans under such conditions as they may deem expedient, but all loans must be recorded and be shown, if so requested at each meeting of the Executive Committee, and such loans must be approved by the Committee or suitable action taken thereon.

ARTICLE XIII.

Meetings.

Section 1. The annual meeting of the members shall be held on the first Wednesday of September, in the city of Boston, County of Suffolk, and Commonwealth of Massachusetts, at such place and hour, year shall end July 31st.

Sec. 2. The President of the Exchange, or the Chairman of the Executive Committee, when requested by five Directors or ten members, shall call special meetings of the members at such time and place as may be stated in a notice of said meeting.

Sec. 3. The Clerk shall give notice in writing of all meetings by mailing a copy thereof to every member at his last known address, ten days at least before the time of the meeting.

ARTICLE XIV.

Quorum.

Section 1. Ten members shall be required for a meeting of the membership, and five members shall be required for a meeting of the Board of Directors, and three members shall be required for a meeting of the Executive Committee of the Exchange.

Sec. 2. There may be voting by proxy through a local delegate representing local members.

ARTICLE XV.

Reports.

Section 1. A financial statement of the year's operation shall be made and printed as soon as possible after the close of the fiscal year, and together with the managers' reports shall be sent out with the notice of the annual meeting to all members of the Exchange.

Sec. 2. The minutes of the annual meeting shall be printed and sent to every member.

Sec. 3. Minutes of the meetings of the Board of Directors and the Executive Committee shall be sent to all the members of their respective bodies.

ARTICLE XVI.

Grading, Packing and Shipping.

The Exchange shall adopt uniform standard grades, packages, labels and trade mark for the members of the New England Poultry Producers' Exchange, which shall be copyrighted and registered and become its property, and they shall be attached only to such products as shall be ordered by the Board of Directors.

ARTICLE XVII.

Product Control.

The New England Poultry Producers' Exchange shall have control of the poultry and poultry products of every member unless such member give notice in writing to the Exchange between January 1st and 15th of any year that he will withdraw a specific portion or the entire output of his poultry products from the control of the Exchange for the ensuing year.

ARTICLE XVIII.

Emergency Capital.

Section 1. At the time of uniting with the Exchange, each member shall give a negotiable promissory note, payable on demand, to the order of the Exchange. Such note shall be for the sum of $10.00, and an additional $1.00 for each 100 head of mature stock, the products of which are to be marketed through the Exchange.

Sec. 2. These notes shall be the property of the Exchange for the purpose of being pledged by the Board of Directors as collateral security for any loan that may be necessary in the conduct of the business of the Exchange. Any member's note may also be available in the settlement of any liquidated damage that may result from the failure of said member to live up to his contract with the Exchange.

ARTICLE XIX.

Savings and Assessments.

Section 1. Savings shall be returned pro-rated according to the volume of business recorded on the books of the Exchange for the individual members.

Sec. 2. Assessments shall be levied to cover necessary operating expenses not otherwise provided for on the basis of volume of product handled for each member.

ARTICLE XX.

Expulsion.

Any member of this Exchange, after opportunity for an open hearing has been given him, may be expelled by a vote of the Board of Directors representing two-thirds of their number for any reason which to them may seem sufficient at any regular or special meeting of the Board of Directors, provided the interest of each member in the assets of the Exchange be appraised by the Board of Directors and payment tendered to such member within 60 days, conditioned only upon the return and cancellation of his certificate of membership. Upon such expulsion the right of membership in this corporation ceases.

ARTICLE XXI.

Amendments.

These by-laws may be amended at any regular or special meeting of the members of the Exchange called for that purpose by three-fourths of the qualified voters present and voting in the affirmative, provided that written notice shall have been previously given to each member setting forth the proposed amendment at least ten days before said meeting.

COST OF MARKETING EGGS.

The United States Food Administration of 1917 requested Mr. Paul Mandeville of Chicago to prepare a brief of the pertinent facts pertaining to the cost of marketing eggs; a compilation of the factors of cost; the cost of typical operations, and some general information about the egg crop. Perhaps no man in America is in a better position to furnish these facts than Mr. Mandeville and they are of such importance that we quote them here for the benefit of our students.

It is the general belief of experienced men in the egg business that reasonable economy of operation has been attained. The trade have on the whole been open to new ideas, and few lines have attracted so many experimental movements as the egg business. If practice in this line may be found backward compared with other lines of merchandising, it is due rather to a lack of standards in operation and to some extent also to a lack of standards in equipment and supplies, than to any backwardness in trying out new ideas.

The distributor of eggs who is strong enough to control his own retail outlets and who receives direct regular shipments from country storekeepers probably has as direct and economical a method of operation as can be devised for eggs. Egg preparations are not commonly sold for household use and marketing eggs in the shell is a merchandising operation.

The large number of factors making up the total cost of handling eggs suggest that short cuts would be profitable. Many are tried every year and in the spring such plans are successful to the point of cutting out most of the distributors' profits. But for eight months, from June to February, experience and facilities seem to count for more.

The class of so-called **pure speculators** are for the most part keen observers of the market and serve a useful end in their way; taken as a class, their profits are largely offset by their losses and their expenses are small compared to the value of a season's crop of eggs. There has been and is a lack of accurate crop information available to the rank and file of the trade. Comprehensive aid in this direction by the government would lessen the speculative risk and in the same degree would lessen speculative losses, which must now be counted as an expense on the business.

The cost of assembling and distributing eggs cannot be reduced to a table which is applicable to the whole country; it is a local problem everywhere. There are common factors in the cost of getting eggs to consumers in the larger markets, which may be tabulated, but these costs vary according to the volume of business running, the season of the year wherein it affects the cost of grading, the distance from market, and climatic hazards. At some seasons the losses due to climatic hazards are almost negligible, and costs, likewise quotations, can be reduced to variations of one-quarter cent per dozen. At other seasons the climatic element is the foremost factor in the cost.

The factors of cost mentioned herein are not so many middlemen. Two or more operations are usually conducted by one operator and the several functions overlap in practice.

FACTORS OF COST AND TYPICAL OPERATIONS.

Figures apply to one Case-30 Dozen of eggs.

1—ASSEMBLING.

a—The cost of gathering and taking the eggs to town is still saddled on the farmer as a chore in most states and in outlying districts where the cost of collection is regarded as too high. The advantages of collection are a better average handling of the eggs, more frequent and more regular gathering. There may also be some saving in cost where farms are close together and where flocks are large. On the whole, however, collecting from the farmers as a business must be regarded as an expense justified in the higher market value of the product. The cost varies according to season and volume from 20c to 40c a case.

b—The container consisting of cases and fillers is now, as a rule, built light and at low cost with the idea of discarding in the distributing market. The eggs may be transferred from one case to another several times, and the case accepted by the Railroad as standard, is capable of several times shipping without seriously impairing its carrying efficiency. Containers that are shipped to distant markets are seldom returned and have small salvage value, the cost is nearly absolute—for domestic cases 17c to 22c. One set of fillers and flats, therefore, cost 10c to 14c.

c—The First Grading, accounting to and paying of farmers varies greatly according to season and volume. When eggs are collected systematically, there is less opportunity for deception as to freshness and the custom is to receive the eggs without grading. Typical costs of receiving and paying for eggs according to grade at a town store are 15c to 30c per case. (Compare sale costs factor 4-a.)

d—Shipping to Concentration Point is largely a factor of sale (factor 4-b) and of transportation (factor 3-a), but includes also delivery to and from the depot to the packing plant, about 5c per case.

e—The Second Grading at Concentration Point may consist merely of lifting covers, recapping (new excelsior flat and new top fillers, etc.), and packing any damaged cases, 3c to 5c per case. Or it may involve thorough grading, repacking for storage into several grades, candling, etc., which may represent a labor cost of 10c to 18c a case.

f—Shipping to Central Market is a transportation factor usually involving only labor of loading cars, cost of dunnage, car bracing, etc., 1c to 3c per case, (see factor 3-b).

g—To the above may be added in some instances **Receiver's Cost** at central market. Where the receiver sells to a distributor, add cartage 3c and handling charge 5c per case. The remainder of the receiver's cost is a sales factor.

2—DISTRIBUTING.

a—**Delivery to Jobber** is generally effected by team or auto either direct from team track or from receiver's store. Large distributors may have their own side track. The cost of delivery to jobber is 2c to 5c per case.

b—The **Final Grading** and cartoning may be done by the jobber or by the retailer and varies in cost according to the character of grading which has been done at the source, and to the degree of deterioration in transit, etc. At some seasons the eggs may not even be candled. Cost 5c to 25c per case. (Losses due to rejection in candling are considered with factors in group 5).

c—The **Cartons** for a case of eggs cost 24c to 36c.

d—**Delivery to the Retailer** is also a sales factor (4-b), the salesman often traveling with and delivering the eggs. The cost of straight delivery in large cities in one to five case lots is 10c to 25c per case.

e—**Delivery to the Consumers** in dozen lots, where a regular trade has been established and the route is compact, costs 40c to 60c per case. Where deliveries are made with other groceries to close-up trade the cost may be reduced. See also Sales Factors (4-a).

f—**Export Cases** are seldom used at first packing. Eggs intended for export are repacked into heavier cases and fillers. Cost of export cases 30c to 40c; export fillers 15c to 18c per set (for one case). The salvage in the original container, which is discarded, is little more than the cost of sorting and marketing. The cost of grading for export is similar to "**Final Grading**" (factor 2-b).

3—TRANSPORTATION.

a—Typical freight **To Concentrating Point,** 5c to 15c per case.

b—**Freight to Central Market** varies widely. Typical car lot freight from a packing point in Iowa to Chicago or from Indiana to New York is 15c to 35c per case.

c—Typical freight **From Central Market** to tributary market 5c to 15c per case.

NOTE—During the winter and until the market declines to spring level it is common to ship by express which raises the cost of a, b and c two to three times.

d—Freight to central market may be divided when eggs are stored in transit. One function of the warehouse is to afford an opportunity for diverting reserves late in the season to the market first to become exhausted and in a movement of this kind eggs may be shipped back over much the same route whence they originated.

4—SALES COST.

a—Buying eggs direct from farmers or selling them direct to consumers in dozen lots are similar transactions, involving a cost from 20c to $1.00 per case. Cash sales on bargain days at department stores, etc., may easily be reduced to the lower figures, while personal attention required by the salesman in a high grade neighborhood store may cost the higher figure.

b—Purchase or sale in case lots costs 10c to 30c.

c—Purchase or sale in jobbing lots (20 to 100 cases) costs 5c to 20c per case.

d—Sale in car lots costs 3c to 10c per case.

The above sales costs do not include delivery and handling but represent that portion of the cost which is sometimes figured as "overhead"—getting the buyer and seller together.

5—CLIMATIC LOSSES AND LOSSES DUE TO EXPOSURE AND CARELESS HANDLING.

These losses are represented by price reduction due to general deterioration or to shrinkage from rejections in candling.

a—Climatic Losses vary in the extreme, depending not only upon the state of the weather but upon the condition of flocks and hardiness of the egg. Climatic losses are minimized in April owing to a large volume running, frequent gathering, cool weather, hardy eggs, etc. Typical losses in August where eggs are not under refrigeration, 10c to $2.00 per case.

b—Losses from Exposure are usually the result of ignorance and often are not recognized, as, for example, from exposure to sunshine and heat when eggs are displayed in a store window; exposure to rain when the farmers are bringing them to market; dampness in cellars; musty odors from old fillers, etc. Losses from exposure are difficult to reckon in dollars and cents. A carload of eggs may become musty from frequent changes, due to opening and closing car in hot weather, causing condensation and dampness from contact with the warm moist outside air. When the dampness is followed by heat, a car may depreciate $2.00 to $3.00 a case in transit and while awaiting sale. Typical losses from exposure are from 5c to 30c per case, and where eggs are properly handled and well protected, losses due to exposure approach nil.

c—**Freezing** is another loss of this class. A frozen egg usually splits wide open and becomes a leaker. It occurs in severe weather when losses therefrom are sometimes considerable. Typical losses due to freezing are 10c to 60c per case.

d—A frequent cause of depreciation is **rough handling** which results in broken shells and, what is often quite as serious, broken down contents. The content of an egg is delicately formed and has a definite structure which breaks down when roughly handled, causing the egg to become watery. Typical losses from this causes are 5c to 25c per case and when a shipment is badly shaken up may amount to much more.

e—Against saving from exposure and careless handling must be placed the **cost of protection,** such as cold storage, refrigerator cars, dunnage, extra packing, preservatives, etc.

6—STORING.

a—The larger **Cold Storages** charge 30c to 40c per case for the season ending January 1st. It is customary to quote a monthly rate on eggs stored in the summer and fall for short term. The usual charge for three months is 20c per case. Warehouses in the South, in the West and in smaller cities sometimes charge higher rates up to 60c per case, for season.

b—Eggs are also **Held on Track** awaiting clearance on a glutted market and it is sometimes found profitable to stand a charge of $20.00 to $30.00 a car or 5c to 7c a case rather than to unload.

c—**Storing Eggs in Liquids** is now rarely practiced commercially. At home and in small quantities it costs anywhere from 30c to 60c a case, according to the price which druggists charge for the liquid.

7—MARKET CONTROL.

This factor of cost is most difficult of all to reduce to a figure. It consists of:

a—**Information.** Trade papers and ordinary correspondence by mail and telegrams keep the widely scattered trade in eggs informed. Associations have recently adopted a liberal policy of collecting and disseminating information. The Bureau of Markets at Washington, D. C., has been a recent aid.

b—There have been attempts to **Regulate By Law** certain abuses or assumed abuses in the business, some of which have been helpful, but nearly all of which have been the occasion of upsetting to some extent the established channels and creating new channels of trade, and this always results in an expense for the time being.

c—Prices are controlled **By Speculation,** sometimes meaning the legitimate provision in advance of requirements by established trade and sometimes meaning pure speculation. **A Pure Speculator** who deals in car lots, buying and selling from the regular trade adds 15c to 25c a case to the cost, representing the cost of assembling his line added to the cost of disposing of it. On the face of it where the same car changes hands a number of times it would appear that unnecessary expense has been added to the cost of the eggs, but an analysis of this cost is not convincing. When a car has once been inspected and its quality has become known in a central market, it is always cheaper to deal in the same car or block of cars than to inspect a new line, and as a result certain particular lines of eggs become current in the speculative trade, and the ups and downs of the market represent both profits and losses on these particular cars; meantime the bulk of the reserves in storage are held by the regular trade and do not share in this expense.

TYPICAL OPERATIONS.

Freight varies with the class of service and the distance from market. In the following examples the farm is assumed to be located in a small town in southwestern Iowa and the consumer in Chicago. Only one freight is shown, being the combination of rates to concentrating point and from concentrating point to Chicago. Likewise cost of grading, wherever done, is combined.

1—COST OF MARKETING A CASE OF FRESH EGGS IN FEBRUARY

The first run of fresh eggs in the winter appears, as a rule, on a declining market and the most important object is to get the eggs to market quickly. It is common to ship by express, to consign without previous sale and to sell out all receipts daily, getting them so far as practicable into immediate consumption. Secondhand containers are customarily used. The quality is good and candling is generally dispensed with. The only concern is to see that none of the old crop is mixed with the new. Principal losses are from freezing and breakage.

Typical costs of the various stages are:

	Per Case
Container	$0.20
First buyer's gross profit	.10
Concentrator's gross profit	.05
Freight (if express 90c)	.44
Receiver's gross profit	.05
Sale and delivery to distributor	.08
Labor, grading	.07
Shrink in grading	.05
Cartons	.30
Wholesale distributor's gross profit	.10
Sale and delivery to retailer	.15
Retailer's gross profit	.60
Sale and delivery to customer	.60
	$2.79

2—COST OF MARKETING A CASE OF FRESH EGGS IN APRIL.

In the spring the supply exceeds the demand and the quotation is governed by the interest shown in storing eggs. The run is so large that undergrades, not desirable for storing, are a large factor in the supply for immediate use. These undergrades consist of slightly dirty, undersize and checked (slightly cracked) eggs. The quality of all receipts is good. Daily variations in the quotation are only fractions of a cent per dozen. Country storekeepers and even farmers are shipping direct to neighborhood stores in the large cities and there is a tendency to cut out as many middlemen as possible. Eggs are featured at this season by the retailers and are often sold at cost. In all classes of the trade, profits are smaller, but the volume of business is larger.

Typical costs of the various stages are:

	Per Case
Container	$0.30
Collection (if not collected, add 10c to first buyer and 10c labor and shrink grading. Grading is frequently omitted however)	.20
First buyer's gross profit (See Collection)	.05
Concentrator's or receiver's gross profit	.10
Freight	.35
Sale and delivery to distributor	.07
Labor, grading (usually sold ungraded)	
Shrink in grading (usually sold ungraded)	
Cartons (use limited in April and May)	
Wholesale distributor's gross profit	.05
Sale and delivery to retailer	.10
Retailer's gross profit	.15
Sale and delivery to consumer	.50
	$1.87

3—COST OF MARKETING A CASE OF FRESH EGGS IN JUNE.

With the advent of warm weather it becomes necessary to pay more attention to the use of proper facilities and proper handling. The farmer is usually paid on a "lose-off" basis and according to quality. Such eggs as are stored have to be carefully candled and only the very best are desirable. Candling also is necessary at point of distribution. The neighborhood store finds it difficult to obtain satisfactory quality direct from the farmer or country merchant, and has no outlet for a shipment unsuited to its trade. The wholesale distributer becomes once more a useful factor.

Typical costs of the various stages are:

	Per Case
Container	$0.30
Collection (if not collected, add 10c to first buyer and 15c to labor and shrink grading)	.25
First buyer's gross profit (See Collection)	.05
Concentrator's or receiver's gross profit	.10
Freight	.35
Sale and delivery to distributor	.10
Labor, grading	.15
Shrink in grading (See Collection)	.10
Cartons	.30
Wholesale distributor's gross profit	.15
sale and delivery to retailer	.25
Retailer's gross profit	.60
Sale and delivery to consumer	.60
	$3.30

4—COST OF MARKETING A CASE OF FRESH EGGS IN AUGUST.

The first run of the second crop begins to appear during and after the harvest season. Nights are cool, flocks get more or less grain feed from offal of the harvest and the general quality of eggs that are well cared for improve. There are hot weeks, however, and sometimes extreme losses result. The trade are compelled to exercise the greatest care in buying. There is a wide range in the quotation, often as much as $4.00 to $5.00 per case. Part of the finest selections from August receipts are stored for fall use. At the same time the total production falls below consumption and the trade begins drawing upon reserves stored in the spring. The following costs apply to No. 1 fresh eggs of the best average quality, to obtain which it is necessary to discard more worthless eggs and to sell the various undergrades at a greater discount than in June.

Typical costs of the various stages are:

	Per Case
Container (once used)	$0.20
Collection (if not collected, add 10c to first buyer and 20c to labor and shrink grading)	.30
First buyer's gross profit (See Collection)	.10
Concentrator's or receiver's gross profit	.20
Freight (if express 90c)	.39
Sale and delivery to distributor	.10
Labor, grading	.15
Shrink in grading (See Collection)	.50
Cartons	.30
Wholesale distributor's gross profit	.25
Sale and delivery to retailer	.25
Retailer's gross profit	.60
Sale and delivery to consumer	.60
	$3.94

5—COST OF MARKETING A CASE OF FRESH EGGS IN OCTOBER.

There is keen competition for the last of the fall lay and the fresh egg market advances in proportion to the decreasing receipts. As the advance in price is an annual occurrence, there is a tendency to take profit by holding back the crop at every stage in its movement beginning with the farmer. As a result current receipts of fresh eggs in October are badly mixed with held stock. The stale eggs when sorted out are often of less value than good storage eggs. Strictly fresh meantime command a high premium and the range in the quotation is correspondingly wide. The movement being small, the cost of handling per case increases.

Typical costs of the various stages are:

	Per Case
Container (once used)	$0.20
First buyer's gross profit	.30
Concentrator's or receiver's gross profit	.20
Freight (if express 90c)	.44
Sale and delivery to distributor	.15
Labor, grading	.20
Shrink in grading	.55
Cartons	.30
Wholesale distributor's gross profit	.30
Sale and delivery to retailer	.25
Retailer's gross profit	.90
Sale and delivery to consumer	.60
	$4.39

6—COST OF MARKETING A CASE OF FRESH EGGS GATHERED AND STORED IN JUNE, WITHDRAWN AND SOLD IN SEPTEMBER.

This is the typical "summer storage." Eggs appearing on the market in June are the last of the spring lay, are not as good keepers and are as a rule marketed before the April eggs are withdrawn. An exception occurs during extremely warm weeks in summer when the supply of good fresh eggs is badly curtailed and first-class trade is supplied with Aprils-Mays in preference to June eggs, the early eggs being better quality.

Typical costs of the various stages are:

	Per Case
Container	$0.30
Collection (if not collected, add 10c to first buyer and 15c to labor and shrink grading)	.30
First buyer's gross profit (See Collection)	.05
Concentrator's or receiver's gross profit	.10
Freight	.35
Storage	.20

Interest and Insurance	.19
One car lot sale	.08
Sale and delivery to distributor	.10
Labor, grading	.15
Shrink in grading (See Collection)	.20
Cartons (use of cartons for storage eggs is limited, in September)	..
Wholesale distributor's gross profit	.35
Sale and delivery to retailer	.25
Retailer's gross profit	.60
Sale and delivery to consumer	.60
	$3.82

7—COST OF MARKETING A CASE OF FRESH EGGS GATHERED AND STORED IN APRIL, WITHDRAWN AND SOLD IN NOVEMBER.

This operation is typical for two-thirds of the eggs which are placed in storage, the heavy storing being in April and May and the greatest scarcity being in November and December. On account of the good quality of April eggs, the candling loss is less than if candling Junes. The distributing trade, however, are accustomed to taking more profit and not infrequently an exorbitant profit. The practice is not altogether a fault of the trade, but is encouraged by consumers insisting upon getting more fresh eggs than are to be obtained. Five cents a dozen ($1.50 per case) fairly represents the extra profit over the wholesale market still commonly taken either by the wholesale distributor or by the retailer or between them, in the sale of the best storage eggs for fresh, or as 'just eggs.

Typical costs of the various stages are:

	Per Case
Container	$0.30
Collection (if not collected, add 10c to first buyer and 10c to labor and shrink grading	.20
First buyer's gross profit	.05
Concentrator's or receiver's gross profit	.10
Freight	.35
One car lot sale	.08
Storage	.30
Interest and Insurance	.49
Sale and delivery to distributor	.10
Labor, grading (both into and out of storage)	.25
Shrink in grading (See Collection)	.20
Cartons (often sold loose)	.30
Wholesale distributor's gross profit (See Retailer's profit)	.30
Sale and delivery to retailer	.25
Retailer's gross profit (not including any market profit or loss. The extra profit is sometimes taken by the wholesaler, as explained above the table)	2.10
Sale and delivery to consumer	.60
	$5.97

8—COST OF REPACKING A CASE OF EGGS FOR EXPORT.

The unusual conditions in Europe have greatly stimulated the demand for eggs from the United States and Canada to supply a deficiency in England. Prior to the war this movement was spasmodic and was not reckoned as a factor in the market.

Export eggs are packed in cases heavier than the standard domestic case in order to withstand the pressure of being loaded on shipboard by means of a canvas sling or net, and the pressure of a shifting cargo. It is customary also to use heavy white pulp fillers instead of domestic strawboard fillers and the eggs are candled at time of repacking.

Typical costs, based on the use of finest April storage at mark, are:

	Per Case
New containers	$0.53
Extra padding	.03
One cartage	.03
Loading cars (including dunnage)	.02
Labor, grading and repacking	.16
Shrink in grading	.20
Supervision and overhead	.10
	$1 07

THE EGG CROP.

The consumption of eggs in the United States is approximately one egg per day or one case per year per capita, there being 360 eggs in a case. A handy rule for reckoning the weekly egg consumption of any given locality is to double the population and divide by one hundred, which results in about the number of cases consumed weekly taken the year around.

The production of eggs is well distributed throughout the country, and in this respect differs greatly from tobacco, rice, citrus fruits and other localized crops and the problems of distribution are correspondingly different. An outline the shape of an egg, placed over the map of the United States with Chicago in the center, the point of the egg resting on Scranton, Pennsylvania, the southern limit including Tennessee and the northern limit Lake Superior with the butt of the egg cutting Kearney, Nebraska, approximately bounds the states and the Province of Ontario wherein eggs are produced in as large or larger volumes than they are consumed. An exception is found in some parts of Texas and Oklahoma not included in the oval. Eggs are universally consumed in the United States and less than one per cent of the crop is exported. The production, therefore, is approximately equal to the consumption which may be roughly divided into: One-third consumed on the farm; one-third consumed in small towns; leaving one-third of the crop for large markets.

Of the third which comes to market about one-fifth or twenty per cent goes into cold storage at some stage of the movement and it will be observed that this represents not to exceed six or seven per cent of the whole crop.

The last mentioned fact is exceedingly important and must be constantly borne in mind when considering the influence of supply and demand upon prices. A reduction of five per cent in a season's production or an increase of five per cent in a season's consumption of eggs would result in an extreme lowering of reserves unless counteracted by an adjustment to higher prices, and the reserve holds true of an increase in production or a decrease in consumption. With this fact in mind the sensitive movements in the quotation will be readily understood; also the highly speculative nature of the business of storing eggs.

There are two seasons of production, which broadly speaking include the spring season from January to June inclusive and the fall season August to October inclusive. These periods vary somewhat owing to climatic and local influences and overlap, so that there are only four to six weeks in the year when the supply of strictly fresh eggs approaches nil. This period lies between the first of November and the fifteenth of December.

THE COMMERCIAL EGG BUSINESS, LESSON NO. 28.

1. What is the estimated annual loss from bad eggs?

2. What two general classes of reasons may be assigned for the loss in eggs and the difference in price which the producer receives and the customer pays?

3. What influence would it have on the consumption and price of eggs if we could restore confidence in the market egg?

4. At what point should we begin to improve the market egg?

5. What has proper feeding and housing got to do with profitable egg production in your opinion?

6. How can we change the color, size and shape of eggs that hens lay?

7. Which are the most attractive and sell the best, uniform white eggs, uniform brown eggs or brown and white eggs mixed?

8. How are we to breed so that we may improve the quality of the eggs?

9. What one fault is responsible for more loss on the farm than any other one practice?

10. Why should we discourage the use of males in the laying pens?

11. What can you say about the care of the nests for best results?

12. Why should eggs be gathered and marketed often?

13. Why should infertile eggs from an incubator never be marketed?

14. While eggs are being held for market, under what sort of condition or in what sort of place should they be held? Why?

15. What are some of the causes of dirty eggs?

16. What are the advantages and disadvantages of washing dirty eggs?

17. What care should be taken in protecting the eggs while hauling them to market?

18. What five changes take place on the interior of the egg to cause loss?

19. What six external conditions affect the quality and price of market eggs?

20. The real loss on bad eggs comes from what four sources?

PART II

Handling and Grading Eggs For Market

By

M. E. Pennington and H. C. Pierce

Food Research Laboratory, Bureau of Chemistry, United States Department of Agriculture

INTRODUCTION.

The egg trade of the United States involves not only a vast number of people, but represents an enormous sum of money annually. It yields, also, a foodstuff of very high value, which is assuming greater importance to the nation because large meat animals have become scarcer and higher priced. Many of the difficulties surrounding the production of meat animals do not apply to poultry. Chickens will thrive under widely varying conditions and can be fed a variety of feed, much of which would otherwise be wasted on the farm.

The broadcast nature of poultry raising is another important feature. The census of 1910 states that poultry is raised on 87.8 per cent of the farms of this country, but it does not take into consideration the many producers of poultry and eggs in the towns or city suburbs where the small chicken yard plays a significant part in the egg and poultry supply of the community.

An idea of the great number of shippers of poultry and eggs in the producing section may be obtained by referring to Missouri, in which state is located 1,562 poultry and egg shippers in 531 towns, many of whom handle car lots. Similar conditions prevail in all the states which produce more eggs than are consumed within the state, and even in those sections of the country which must depend on the corn belt for a large part of their supply the distribution of the home production, be that large or small, is in the hands of many merchants.

Modern methods of conservation have greatly altered the status of the egg trade in that there is now a demand for eggs at good prices during the flush season because they can be stored for use in the season of scarcity.

Frozen and dessicated eggs have provided an outlet in the producing section for small-sized, dirty and slightly stale eggs which can be held frozen or dried for many months until needed for bakers' use. Such advances have done much to increase production and to affect economies in eggs as a food. More must be done, especially along the lines of educating producers, shippers and consumers how to determine the quality of eggs marketed and how to handle the eggs so that they will reach the consumer in prime condition. It is this phase of the egg trade that will be dealt with in the following pages.

Throughout the succeeding chapters there will be found also the gospel of good handling to prevent waste. Only those actively engaged in an educational campaign to lessen the great waste of foodstuffs by spoilage can appreciate the enormous quantities of finished farm products which are each year lost to the nation. To estimate the loss of eggs with accuracy is impossible. Undoubtedly the amount commonly given, namely, 10 per cent of all the eggs produced, is too low. The accompanying picture, figure 2, of the rotten eggs discarded by four candlers during one-half day's work, and gathered from the usual receipts of the concentrator of the central west, gives a graphic idea of their number, which may be confirmed by a visit to any packing house during the summer season.

REQUIREMENTS OF MARKETS.

A preference for certain styles of eggs exists in different sections of the country and also in some cities, as shown by prices paid. Much of this is due to prejudice and lack of knowledge. In high-grade stock, New York and San Francisco will pay more for large white eggs than for brown eggs of equal quality. Boston, on the other hand, will pay more for high quality brown-shell eggs than for white, although the food value is in no way affected by the color. The interior cities, however, have little, if any, preference regarding color; neither do they demand as high quality in the best grades as do the more discriminating eastern markets. The southern section of the country, as compared with the north, is satisfied with the smaller, dirtier and inferior quality eggs, although it is encouraging to observe that the demand for better quality in the south is becoming more and more insistent.

Cuba and the other countries south of the United States have shown an undue preference for small white, dirty eggs, and as a rule the eggs exported to these countries are inferior in size, cleanliness and quality to those consumed in the United States. The reason for these regional differences are always directly traceable to the quality and kind of fowls kept in the regions mentioned. As the New England fowl has usually been of the larger brown egg breeds, the New Englander prefers this type of egg; on the other hand, the fowls near the New York markets are Leghorn varieties, producing a white egg, with a consequent demand for them. The southern fowl in the past has been of a nondescript nature, producing a small egg which has had but little care after laying. The native hens of Cuba lay a small white egg and have but little attention paid to them.

While the consumers of eggs have their preferences, but few of them realize that the territory contiguous to the larger cities supplies but a very small percentage of their consumption, and that the greater portion of the supply is brought in refrigerator cars a thousand miles or more.

EXPORTS AND IMPORTS.

During recent years fewer and fewer eggs have been exported to Europe, although the exports to Canada, Cuba and Panama have increased rapidly.

The year 1913-14, on the other hand, witnessed large importations of eggs into this country from Europe and Asia. Sporadic importations of foreign eggs have been made before, but this is the first time they have made any impression on our markets. This year's importations were due to the high prices of domestic storage eggs and the removal of duty on the imported stock.

It is well for the producer and the packer of eggs to consider the demands of the various markets, that each may be furnished with what it most desires. It must be remembered, however, that those markets expressing a color preference must also have fine quality stock, and that all sections of the country are demanding, and justly so, better and better eggs for food.

DETERMINING THE QUALITY OF EGGS.

Eggs are graded for market according to their size, cleanliness, freedom from cracks and their freshness.

Size, cleanliness, cracks, color and smoothness of shell may be determined by inspection. Freshness may be determined to a certain extent by inspection and handling. To do it accurately, however, the eggs must be rotated before a strong light, which process is known as "candling."

In the spring of the year, when the production of eggs is greatest and the conditions of production, climate and markets are most favorable for the obtaining of eggs of good quality, but little candling is done in the producing section. In the large consuming centers some eggs are candled at all seasons, to insure, as far as possible, the distribution of good eggs only to the best trade.

Later in the year, when the weather is warmer, causing spoilage by heat, or the price is advancing continuously, making it a temptation to withhold eggs from trade, candling is absolutely necessary to discover inferior quality.

Determination of Quality by Inspection.

Eggs which are packed during the early spring and intended for storage under refrigeration are seldom candled.

According to the usual routine in egg-handling establishments, the eggs are transferred by hand from baskets or cases to other cases, care being taken to see that the excelsior padding is well distributed and that all fillers and flats are strong, clean and dry. The operator takes three eggs in each hand determining the grade of each egg by its size, cleanliness of shell, smoothness, color and freedom from cracks. The simple matter of under or oversize may be easily determined by the eye, but there are a few classes that need special mention.

Clicking to Discover Checks.

In those cases where the shell is so broken that it is not readily seen by the naked eye, the presence of the break is determined either by candling or clicking two or more eggs together. In transferring eggs it is very easy to click the eggs together by a movement of the middle finger of each hand. If any of the eggs are cracked they will give out deadened sound, distinctly different from the clear ring of sound-shelled eggs.

Blind Checks, Checks, Cracks, Dents and Leakers.

Broken eggs are grouped in different classes by the following characters:

Blind Check.—Where the shell has the appearance of having been broken in the hen and rehealed.

Check.—Where the shell is cracked but the break is not discernible to the naked eye.

Crack.—Where the break can be seen in the shell but the contour is not disturbed.

Dent.—Where the shell is pushed in but the membranes below are not broken.

Leaker.—Where the shell and membranes are so badly broken that the contents of the egg escapes.

Preserved Eggs.

Eggs preserved in salt and water glass have a washed appearance and have a peculiar sound when clicked. This sound is commonly called "glassy" by egg packers, and is similar to that made by glass nest eggs.

Stale or Shrunken Eggs.

Stale and shrunken eggs are determined by the dingy appearance of the shell, the lightness in weight for the size and a rattling sound in clicking.

Nest Eggs.

Eggs that have been gathered from stolen nests, used as nest eggs, or incubated for some time before gathering, are often "glassy" and oily looking in appearance with a peculiar darkening of the shell.

Black Rotten Eggs.

Eggs that are so far decomposed as to be termed "black rots" have usually oily looking shells with a bluish cast. They are unmistakably determined by their odor.

It can be seen from the foregoing that a careful and experienced person can grade eggs with considerable accuracy by inspection alone. This is especially true during the spring months when the proportion of fresh eggs are highest and the bulk of the cold-stored eggs are prepared.

DETERMINATION OF QUALITY BY CANDLING.

Inspection of the exterior of the egg alone is a satisfactory means of fixing quality for certain periods of the year in the producing sections. In the consuming center, or where the producer serves a high-class trade directly, it does not suffice. "Candling," or that process whereby the content of the egg shell is made visible by means of a transmitted light, must then be followed. In order to candle large number of eggs successfully, special quarters must be provided for the work as well as special apparatus.

Candling rooms must be dark, hence it has been the custom to locate them in some out-of-the-way corner of the packing house where dirt could accumulate unseen and where the odors of the rotten eggs clung tenaciously because of a lack of ventilation. Such candling rooms are almost invariably too small, and the discomfort to the men working in them is increased by the fact that they are used chiefly during the hot months when weather conditions demand the maximum breathing space. Quite aside from the discomfort to the operator, the eggs suffer from the high temperature.

Construction of Candling Room.

The necessity for refrigeration throughout the handling of eggs has recently been carried to its logical conclusion by the installation of refrigerated chill and candling rooms, which are maintained at temperatures of 32 and 55 degrees respectively by means of pipes which contain circulating cold brine. Immediately upon receipt the cases of eggs are placed in the chill room for 24 hours. The eggs are then candled and repacked in cooled cases, which are held in chilled rooms until they are shipped in refrigerator cars. Such treatment checks the deterioration due to heat as promptly as it can be checked, and because refrigeration is maintained with each change of surroundings "sweating" of the shells does not take place. The latter is a most important item in good handling of eggs.

Most candling rooms are too small to allow satisfactory work. Refrigerated candling rooms should be large enough to hold a day's receipts of eggs, allow for the opening and closing of the cases, the candling of the eggs and the holding of cooled cases for at least a few hours. It is absolutely necessary that there shall be a good light for the opening and closing of the cases, that they may leave the candling room well and strongly made. Such conditions are obtained by dropping shaded lights immediately over the work bench, which is placed far enough from the candlers not to interfere with their work. It is necessary to keep a refrigerated candling room tightly closed to conserve refrigeration; therefore, the ventilation must be assisted by a forced chilled-air draught from a bunker room, or, in smaller establishments, by inducing a circulation of air over the refrigerating pipes by means of electric fans. The keeping down of odors by the use of properly constructed rot cans is indispensable in a well conducted candling room.

Non-refrigerated rooms need not be larger than is required for the candlers and necessary candles, cases, fillers and rot cans. The opening of the cases may be done in the daylight out side and the cases slid or carried into the candling room proper where the eggs are candled, after which the filled cases are returned to the outside and the tops are replaced.

In non-refrigerated rooms ventilation may be secured by stopping the side walls 12 inches from the ceiling and keeping the light out by a false wall extending downward 24 inches from the ceiling and 12 inches distant from the wall proper. The inner surface of both walls are painted black to prevent light from entering. The doorway is usually closed by overlapping curtains. Good ventilation may be obtained by the use of an electric fan. It is well, if possible, to place one or more ventilators to extend above the roof.

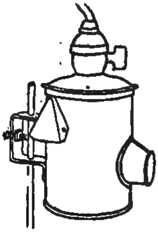
Where only a few cases of eggs a day are to be candled, as at the country merchandise store, a closet or booth large enough to accommodate two cases of eggs, the candle and the operator will suffice. For the small but up-to-date egg shipping house, accumulating on an average a car load per week throughout the year, the candling room should be large enough to accommodate four men and should measure about 20x20x9 feet. To refrigerate a candling room of the above dimensions would ordinarily require a machine capable of furnishing refrigeration equivalent to three tons of ice per day, provided the insulation is equivalent to four inches of good cork board.

EQUIPMENT.

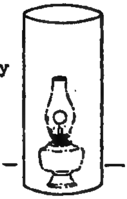
Arrangement of Benches and Cases.

There are two distinct methods of arranging a candling room. One is where each man candles and grades an entire case, and the other where two candlers work on the same case, with a double candle over the case, which is between them. The space occupied by the candlers' benches and cases is approximately the same in either method. Where two candlers work on the same case there are fewer cases on the benches and less handling of them. The fixing of responsibility of the proper grading of the egg is possible only when an entire case is assigned to the candler, and by no other means can the packer insure accurate grading of the product.

Generally the case of eggs to be graded is placed directly in front of

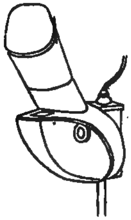


Food Research Laboratory or Spout Nose Candle. See Detailed drawing on following page.



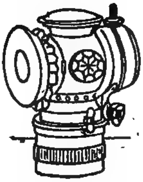
Stove Pipe Candle

A piece of stove pipe with 1¼" hole opposite light flame.



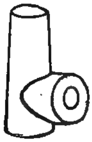
Daylight Candle

Several daylight candles for use with electric, acetylene, or oil lamps are now on the market. These can be used very successfully without a dark room.



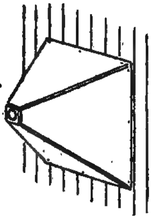
Bicycle Lamp Candle

Ordinary bicycle lamp with piece of soft leather stretched firmly over face and tied. 1¼" hole in center of leather.



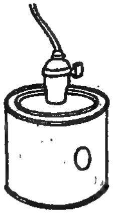
Incubator Candle

Ordinary incubator tester such as can be purchased from all poultry supply houses.



Sunlight Candle

Pyramid shaped box projecting into the south wall of candling room. 1¼" hole to admit light in the end of the box.



Tin Can Candles

A removable top can big enough to take an incandescent lamp with 1¼" Hole opposire light filament.

EGG CANDLING DEVICES

U.S. Department of Agriculture.

the candler, or at his right and crosswise of the candling bench. The empty cases, into which the eggs are to be placed according to grade, are at his left; or, if three grades are to be made, one of the receiving cases will be placed on his right beyond the case from which the eggs are being graded. The can for rotten eggs should stand at the candler's right and sufficiently close to permit of the eggs being **placed** in it, not **thrown** at it. There is no excuse for breaking the shells of rotten eggs in the candling room.* A supply of new fillers and flats should be stacked on a shelf in front of the candler and at a convenient height that he may readily see and reach the stock. He should also have a supply of clean, dry excelsior at hand.

The height of the benches and candles should be adapted to the height of the operator, so that he may work with the least effort. Ordinarily they vary from 22 to 24 inches and 38 to 44 inches, respectively. The width of the benches should be about one inch less than the length of an egg case. The length of the bench depends upon the number of grades of eggs to be made by candling.

Rot Can.

To replace the filthy, odorous, open topped bucket or can used for the disposal of rotten eggs, a common galvanized garbage can can be used to good advantage by making a few alterations. The ordinary top should be remodeled by placing a funnel in its center with an opening 5 inches in diameter at the top and 3½ inches in diameter at the bottom, and extending 2 inches below the top edge of the can. The funnel projecting below the top of the can makes it easy to prevent filling the can too full, as the contents will rise in the funnel before the can overflows. The can may be mounted on trucks to allow of easy moving. If a direct count of the rotten eggs is desired, an automatic counter may be mounted on the cover in such a position that it can be pressed by the wrist of the candler when placing eggs in the can. Placing about 6 inches of a good disinfectant in the can before starting to candle helps to reduce the odors to a minimum and renders the can easier and less disagreeable to clean after dumping.

Description of Candles.

The most important part of the equipment of a candling room is the candle itself, and great care should be exercised to see that the type of apparatus in use is efficient, that it is in good order and that the globe is clean, that the light may always be uniform. The chief variation in candles is the source of light. All egg candles consist of a shield to exclude the light except at one or two holes before which the eggs are held. Candles are known as "two-hole" or "one-hole" candles, respectively. The one-hole candle is the better because there is less strain on the eyes of the operator and the opportunity for greater accuracy of work.

The sources of light used in candling are daylight, electric light, acetylene flame, gas flame, gasoline vapor flame and kerosene flame.

Daylight.

Because of its whiteness daylight, when strong enough, is the equal, if not the superior, of any other form of light. It is used in many places where electricity is not available and where comparatively few eggs are examined.

The simplest daylight candle consists of a tube, or roll of paper, having a diameter of approximately 1¼ inches. Each egg is held at one end of the tube and the other placed closely against the eye. Then by holding the egg so that sunlight strikes it the quality of the egg may be seen. This method is used by hucksters to determine definitely the quality of eggs of suspicious external appearance.

In towns where day electric current is not supplied daylight candling rooms are frequently found. These consist in some instances of dark rooms into which the eggs are taken and held before one or two holes in the wall facing the lightest side of the building. This method is somewhat inconvenient because it is necessary for the candler to either place the cases lengthwise along the wall or to reach across the longest dimension of the cases. To make it easier, some rooms are built with an inward angular projection extending 13 inches from the wall and at a height above the bench so that one-half of the case may be run under the projection and at a proper height for the candlers. This allows the cases to be placed endwise against the wall. The candling holes are placed in the angle and the outside surfaces of the projection lined with bright tin or mirrors, so arranged as to throw the light against the holes. This arrangement may be easily fitted into the lower half of a window, the upper half being covered to exclude the light.

Electric Light.

Where bulbs having filaments giving a white light are used, the best source of light for candling is electricity. This is because of its whiteness, steadiness and ease of control. If thirty or more cases are to be candled in a day, it would probably pay to install a small generator run by a gasoline or kerosene engine to supply electric lights, provided current cannot be secured from the town or city service.

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*In New York the law compels all candlers to break and denaturize rotten eggs as soon as detected.

Candle for Use with Electric Light.

Figure 5 shows a candle for use primarily with electric light. It consists of a ventilated can with a movable top and an extension on one side, forming the candling hole. It is adjustable to the height of the various candlers by means of the slide on the rod, fastened to the shelf above the cases. Holes in the bottom throw light into the cases on the bench without glaring. Hooded holes near the top throw light into the cases, but they are intended primarily as ventilators to insure the lamp from overheating. The cover is easily removable to allow cleaning the lamp, and contains a tube to prevent the escape of light around the electric bulb socket. The spout covering the candling hole prevents the operator from looking directly into the light, and it is painted black on its lower inside half so that the light is not reflected into the eyes of the candler. The inside of the candle is of bright tin to reflect the light through the hole, while the outside is painted black to prevent reflection. A 40-watt white light is advisable for these candles.

Acetylene.

Acetylene gas is a good source of light in that it is white and gives a steady flame, but it has the disadvantage of being hot. It may be adapted to a candle such as is shown in figure 5 by mounting the burner in place of the electric bulb and making the size of the candle 2 inches greater in diameter and 2 inches higher above the egg hole.

Gas and Gasoline Vapor.

When used in connection with incandescent mantles, gas and gasoline vapor gives a white light, but also an intense heat. The same is true of kerosene mantle lamps. These sources of light are not satisfactory because of the frequent breaking of the mantles and the intense heat which is thrown into the candling room, adding to the usually prevalent heat of the candling season. Where they must be used, however, the candle should be at least 8 inches in diameter, 12 inches high and have plenty of ventilation. Without mantles the lights are too yellow to permit of satisfactory candling.

Kerosene Lamp.

The poorest light next to the old-fashioned candle is the yellow-flamed kerosene lamp. Because of the yellow color of both the egg and the light it is impossible to determine accurately the appearance of a heated egg. These lights are also hot, liable to smoke and insufficient in illuminating power. They are used sometimes set inside of a stove-pipe, having a 1¼ inch hole opposite the flame, with a piece of bright tin behind the light as a reflector. Good ventilation must be afforded the lamp to prevent its smoking.

FORMATION AND STRUCTURE OF THE EGG.

If the effects of deterioration are to be clearly understood it is necessary that a brief description of the structure and formation of a normal egg be given. As stated elsewhere, the hen lays an egg to perpetuate her species and not for human food. This description will consider the egg not only as a food for human beings, but as a carrier and furnisher of food for the developing chick during incubation.

Commencing at the center and proceeding outward, we find the egg to be composed of the yolk, the white or albumen, the shell membranes and the shell.

The yolk is composed mainly of fat, protein and water and varies in color from light yellow to reddish-orange, depending chiefly upon the feed that the hen has received. On the surface of the yolk is the germinal disc, which appears in a strictly fresh egg as a small, round, light-colored spot. It is in the center of this disc that the embryo starts to develop. When the egg is placed upon the side the yolk changes its position so as to bring the germinal disc uppermost, where the developing embryo may receive the greatest amount of heat from the body of the hen during incubation.

The yolk is encased in the vitelline membrane, around which lies a small quantity of thin white; then comes a heavy layer which is termed "thick white," and outside of this, again, is another layer of "thin white," which lies against the inner shell membrane. Extending from the yolk through the white toward each end of the egg are twisted cord-like coils of a white substance called the chalazae. These serve to hold the yolk in position yet allow it to turn freely as the egg is rotated The yolk appears to be strung between them. There is no relation between the chalazae and the fertility of the egg as is sometimes erroneously supposed. The chalazae are present in every egg whether it be fertile or infertile. Between the white and the shell are two shell membranes.

When an egg is just laid the contents entirely fill the shell. As the egg cools after laying the contents shrink and an air space appears between the two membranes. This usually comes at the larger end of the egg. The air cell increases still further in size as the contents of the egg evaporates, and its size is used in candling as a rough indication of the age of the egg.

The egg cells are present in the ovary of the female chick when hatched but do not develop until the pullet approaches maturity. As the pullet reaches laying condition the tiny cell increases in size by the accumulation of the yolk material, but the spot which is to form the chick remains on the surface, so that finally the whole yolk is formed and yet it is but one cell. When a hen is laying freely the yolk is completed in from eleven to fourteen days. When the yolk is completely formed the sack in which it is held in the ovary ruptures and it drops into the mouth of the oviduct. Here, if spermatozoa are present, the part of the cell which is to form the chick is penetrated by the head of the sperm cell, which, with the subsequent activity of the united cells, constitutes fertilization. Whether fertilized or not, after reaching the oviduct it is propelled downward by the muscles of the oviduct.

Its progress may be divided into five stages: First, in the mouth of the oviduct, where fertilization takes place; second, its passage through that part of the oviduct in which the albumen is applied and which period occupies about three hours; third, the formation of the shell membranes, which, together with the fourth stage, the formation of the shell, requires about eighteen hours. The shell, which is principally calcium carbonate, is secreted by the shell glands and applied to the membranes like mortar, which hardens upon deposition. Spotted and colored eggs are due to the presence of pigment secreting cells in the shell glands. The fifth stage is the extrusion or laying of the egg through the cloaca.

The egg may be laid within a short time after the shell is formed, or it may be held in the cloaca for several hours or even several days.

As an egg is fertilized immediately after leaving the ovary and usually remains in the oviduct for at least twenty hours before laying, the germ is subjected to the heat of the body of the hen, and if fertilized undergoes, in her body, the first stages of development. In other words, a fertile egg starts to hatch before it is laid. This development will continue after the egg is laid whenever the temperature exceeds 68 degrees Fahrenheit, and if continued long enough blood will form in the egg and render it unfit for market purposes. If the egg is infertile this development cannot take place and it is impossible for blood to form, although deterioration and staleness comes with time and undesirable conditions.

The Appearance of Eggs Before the Candle.

While the outside condition of an egg may be determined by inspection, the interior quality can be discovered either by breaking the egg or candling it. The term "candling," as applied to the determination of quality in eggs, is obtained from the old custom of flashing eggs, wherein the eggs were passed before a candle in a dark room and the black rots, together with those eggs containing chickens, were discarded because of their blackenss before the candle. Flashing before an open candle is still practiced to a very limited extent, but has generally given way to better methods and devices as previously described. The term "candling," however, still holds and the devices used are termed "candles" despite the varying sources of light.

When a fresh egg is held before a candle it will be seen to transmit a soft, yellow light with a very slight tinge of pink if the shell of the egg is white and comparatively thin. If the shell is brown the light passing through it will appear decidedly orange-brown, which color deepens as the color of the shell increases. If a very dark brown egg is examined the color before the candle is red-brown. It is difficult to see the interior structure and condition of these brown eggs, whereas the white egg is much more easily studied. For this reason the colored sketches which are used to demonstrate the appearance of fresh and deteriorated eggs were made exclusively from eggs with pure white shells, and were carefully selected to show as much of the interior as possible. This tact must be taken into consideration when comparing the illustrations with eggs before the candle. The student of egg candling is advised to begin with white, or light-colored shells, reserving those which are dark until some experience has been gained.

It is necessary to rotate an egg before the candle if one is to obtain an accurate knowledge of its condition. By tilting at various angles the location and size of the air space can be seen, and very often the position of the yolk. But the quality of the egg is very largely determined by the ease with which the yolk moves and the direction of its motion. The operator, therefore, grasps the pointed end of the egg with the tips of the fingers, and holding the blunt end uppermost places it closely against the opening, or spout, of the candle and gives it a quick turn to the right or left, watching the movement of the yolk as he does so. If the egg is perfectly fresh it may be difficult to find the yolk at the first glance, but as the egg is turned a glimpse of it will be obtained. A "white rot," on the other hand, never shows the yolk as it is rotated, hence by this one difference it may be distinguished from a fresh egg.

A tabulated statement of the appearance before the candle of eggs of varying conditions is given below. A description is also given of the eggs when released from the shell.

FRESH EGG.

As It Appears Before the Candle.	**As It Appears Out of Shell.**
Air Space: Small; less than three-quarter inch in diameter.	Yolk: Spherical, firm, membrane strong; germinal disc small, with no sign of hatching.
Yolk: Dimly visible above middle of egg; slow moving when egg is turned; germinal spot not discernible.	White: Firm and thick; opalescent. In an infertile egg the germinal disc is exceedingly small.
White: Translucent and firm.	

STALE EGG.

Before the Candle.	**Out of Shell.**
Air Space: Large; may be movable in outline. (Plate 4.)	Yolk: Flattened; sometimes mottled, with deeper colored spots; germinal disc generally shrunken; either small or enlarged; membrane weak.
Yolk: Plainly visible; definite in outline above or below middle of egg; moves quickly when egg is turned. (Plate 3.)	White: Watery, with very little thick white; less opalescent than a fresh egg; does not reflect the light like a fresh egg.
White: Translucent and thin.	

Cause: Long holding after egg is laid, allowing evaporation and breaking down of the mechanical structure of the white. The yolk also absorbs water from the white. Most common form of deterioration in the fall of the year.

Prevention: Marketing eggs promptly, not holding them.

EGG WITH SETTLED YOLK.

Before the Candle.	**Out of Shell.**
Air Space: Generally large.	Yolk: Flattened, with weak membrane; germinal disc may or may not be enlarged.
Yolk: Below middle of egg; plainly visible, appearing to roll spirally upward when turned before candle.	White: Watery; opalescence lost; does not refract light to any extent.
White: Translucent and thin.	

Cause: Long holding in a cool place, thus allowing the white to weaken in structure, the yolk to gain in moisture and weight and sink through the white. In the last stages the yolk may stick to the shell. Most commonly seen in weak, cold-storage eggs.

Prevention: Marketing eggs promptly and not placing weak eggs in storage.

Occurrence: Most commonly in the autumn or after a long period in cold storage.

HEATED EGG.

Before the Candle.	**Out of Shell.**
Air Space: Either large or small. Yolk: Plainly visible, with distinct reddish glow, usually above middle of egg; easily movable when turned before candle. White: Translucent and thin.	Yolk: Flattened; membrane weak, especially around germinal disc, which is enlarged and shows signs of incubation. White: Has begun to thin, but some thick white is still visible.

Cause: Egg is fertile and has been exposed to a temperature above its physiological zero, 68 degrees Fahrenheit, causing germinal development. If temperature is high enough and sufficient time elapses, development will continue until the embryo and blood form. (See blood ring egg.)

Prevention: Do not allow males to run with hens during hot weather so that only infertile eggs may be produced. Market eggs promptly.

Occurrence: During warm weather or hatching season.

EGG WITH MOVABLE AIR CELL.

Before the Candle.	**Out of Shell.**
Air Space: Changes location as egg is turned. May be merely pronounced shrinkage of egg contents or inner membrane may be broken, allowing air to enter interior of egg and to have no fixed location.	Yolk and white: Like that of stale egg.

Cause: Long holding of the egg causes evaporation and consequent increase in size of air cell, which is between inner and outer shell membranes. Thus, as the egg is turned, the contents flow and the boundaries of the air cell change. If the egg is shaken severely by hand, or by other rough handling, such as hauling over rough roads, the inner membrane may become broken, allowing the air to enter the white. Then, when the egg is turned in any position, the air bubble is always on top.

Prevention: Market eggs promptly and avoid rough handling.

Occurrence: During autumn, when the proportion of stale eggs is greatest and in those sections where eggs are subject to rough handling or shaking.

EGG WITH OLIVE-BROWN YOLK.

Before the Candle.	**Out of Shell.**
Yolk: Appears dark-brown or olive. White: Normal.	Yolk: Shows greenish-brown. White: Normal.

Cause: Unknown. Ascribed my some to feeding on fresh, green food, but this observation has not been confirmed.

Occurrence: Most frequently in the spring, but may be seen throughout the year.

EGG WITH BLOODY WHITE.

Before the Candle.	**Out of Shell.**
Yolk: Normal for grade of egg. White: Normal for grade of egg, except small spot or spots waving in white as egg is turned. In severe cases white may show general bloody or spotted appearance.	Yolk: Same as in any other egg. White: Contains small spots of reddish-brown tissue or diffused blood.

Cause: Rupture of ovary or oviduct allows blood or portion of tissue to become included in white of egg as it is formed.

Prevention: Not known.

Occurrence: Infrequently, at all seasons of the year. Most prevalent in late autumn and early spring when pullets begin to lay.

EGG WITH STUCK YOLK.

Before the Candle.	**Out of Shell.**
Air Space: Usually large.	
Yolk: Adhered to shell; may wave but cannot move freely when egg is turned, unless in incipient cases, when yolk may break away from shell.	Yolk: Flattened and hardened at place of contact with shell; yolk membrane usually breaks when egg is opened; germinal disc may or may not be enlarged.
White: Thin.	White: Thin and watery.

Cause: In hot weather, when fertile eggs are kept without turning, the yolk may rise through the white and become attached to the shell membrane. Attachment takes place on the yolk at the germinal disc. In cool weather the yolk may settle in the shell and becomes fastened to the shell membrane. (See settled yolk).

Prevention: The production of infertile eggs only and marketing them promptly.

Occurrence: In summer and autumn and in weak or wet cold-stored eggs.

EGG WITH BLOOD RING.

Before the Candle.	**Out of Shell.**
Air Space: Large or small.	
Yolk: Plainly visible, with distinct bloody ring or portion of ring on its surface. Sometimes lower portion of yolk shows as shadowy crescent, moving quickly when turned before candle.	Yolk: Flattened; discolored; germinal disc enlarged and surrounded by complete or partial blood-ring; membrane tender.
White: Thin.	White: Thin and watery.

Cause: A fertile egg in which the development of the germ has proceeded until blood has formed but the embryo has subsequently died. Ring formation is not present while the embryo is alive, although blood spots or veins may show.

Prevention: Production of infertile eggs. (See heated egg.)

Occurrence: During the hot months, when it is the most common cause of loss.

EGG WITH GREEN WHITE.

Before the Candle.	**Out of Shell.**
Air Space: Large or small.	
Yolk: Dimly or plainly visible.	Yolk: Normal or mottled.
White: Generally normal, but a very thin white shell may permit pale green tint to show.	White: Distinctly greenish in color Frequently has characteristic fetid odor.

Cause: Bacteria which produce a green coloring matter and which penetrate the egg shell.

Prevention: Keep eggs dry and clean.

Occurrence: Most commonly in early spring, but will be found occasionally during all seasons.

MOLDY EGG.

Before the Candle.	**Out of Shell.**
Mold shows as black spots of varying sizes on inside of shell. (In this plate mold shows also in cracks in shell.)	Yolk and White: Generally mixed. showing particles of mold. Mold also shows as gray, brown or black patches, adhering to shell membrane.
Yolk: Where visible is dark.	

Cause: Field nests or wet nests; holding eggs in damp place, or destroying shell mucous by washing, or allowing egg to become wet, thereby enabling mold spores to enter the pores of the shell and grow inside the shell. Mold can also enter through cracks in the shell.

Prevention: Do not wash the eggs. Market them immediately after laying.

Occurrence: Throughout the year, but most frequently in the autumn or in the winter among cold-storage eggs.

WHITE ROT EGG.

Before the Candle.	**Out of Shell.**
Air Space: Large and movable. White and Yolk: Mixed, giving general yellowish color to contents. Yolk: Not distinguishable.	White and Yolk: Mixed together more or less completely. Has unpleasant odor, sometimes sour and sharp.

Requires close examination to distinguish from fresh egg.

Cause: Bacterial decomposition. Usually follows advanced staleness.

Prevention: Prompt marketing.

BLACK ROT EGG.

Before the Candle.	**Out of Shell.**
Contents of shell mixed, appearing black or muddy.	Yolk and White: Mixed. The color is gray, green or dirty yellow. It may contain a decomposed embryo. Strong, repulsive odor.

Cause: Development and death of embryo or by growth of mold inside of shell, accompanied by bacterial decomposition.

Prevention: Market only infertile eggs. Keep them in a dry place and market promptly.

Occurrence: Most frequently during late spring, summer and autumn.

BACTERIOLOGICAL AND CHEMICAL RESULTS OF COMPOSITE SAMPLES OF EGGS OPENED COMMERCIALLY IN THE PACKING HOUSE.

The laboratory results of composite samples of eggs opened commercially in the packing houses are summarized and are shown graphically by the U. S. Department of Agriculture in Bulletin No. 51. From these data the following conclusions are drawn:

(1) The samples of July and August firsts contained very few organisms, and in many cases no bacteria of the **B. coli** group.

(2) The majority of the samples of clean-shelled seconds had a comparatively low bacterial content, only 8.3 per cent of them containing over 1,000,000 organisms per gram. The number of **B. coli** varied in the different specimens from none to 100,000 per gram.

(3) The percentage of bacterial counts over 1,000,000 per gram in samples of dirties, checks, and eggs with yolk partially mixed with albumen was 16.6, 18.8, and 20 per cent, respectively. No greater number of **B. coli** was found in these samples than in samples of seconds.

(4) The samples of blood rings contained comparatively few organisms. The large blood rings in most instances showed more infection than did the small rings. Most of the specimens contained less than 10 **B. coli** per gram.

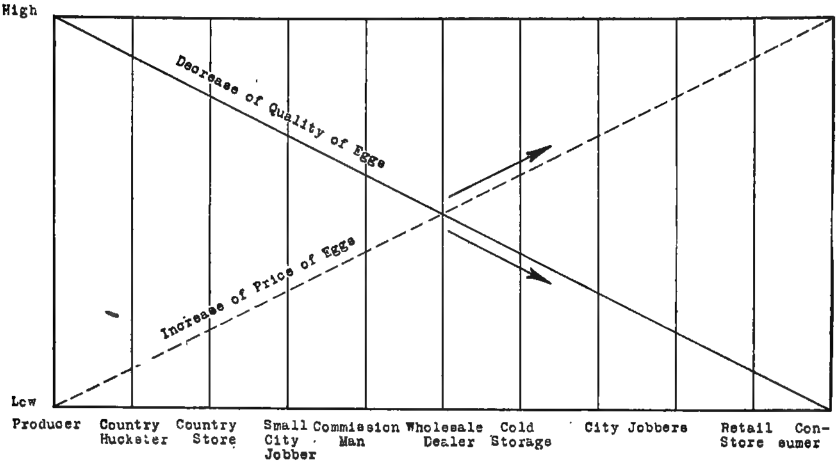
(5) The amount of protein decomposition as shown by the ammoniacal nitrogen in the preceding six types of eggs was greater, as would be expected, than that found in strictly fresh eggs, but was no greater than that found in some grocery eggs.

Although a cracked or dirty shell may be a factor in facilitating infection and subsequent decomposition, the data obtained show that checks and dirties in the producing section are as well preserved as the clean whole shelled seconds or the July and August Firsts

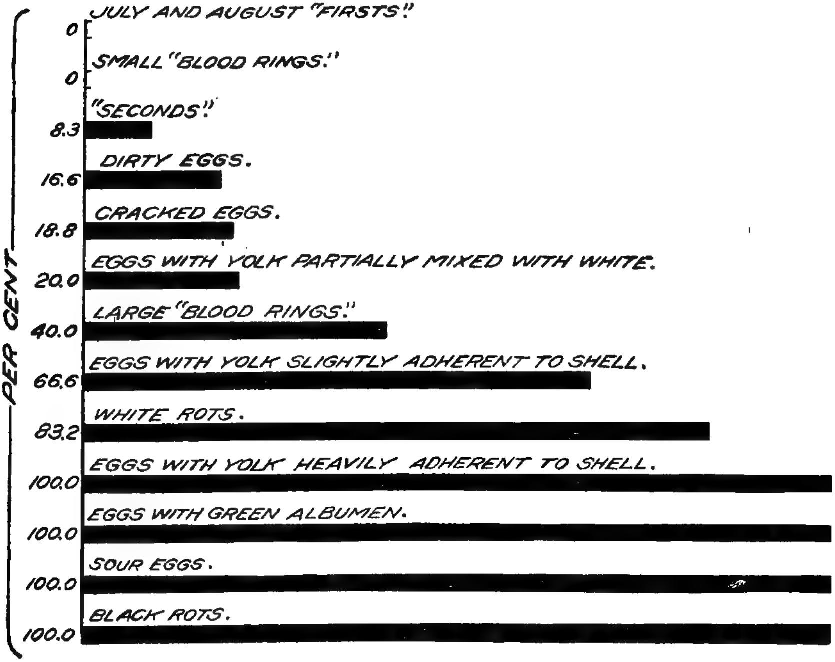
(6) The eggs constituting the samples of July and August firsts, seconds, dirties, and checks would be used without compunction by the housewife, baker, or confectioner.

(7) The majority of the samples of white rots, eggs with yolks lightly adherent to the shell, and all of the samples of sour eggs, black rot, eggs with a green albumen, and eggs with yolks heavily adherent to the shell,

Variations of Price and Quality of Eggs as they pass from the Producer to the Consumer.



This illustration brings home forcibly the fact that the longer eggs are held and the more times they are handled by middle men the higher the price is and the lower the quality becomes.



Percentage of samples opened commercially with bacterial counts over 1,000,000 per gram.

were infested with bacteria. **B. coli** were present in most of these samples, forming the predominating organism in the samples of sour eggs.

(8) The eggs with the yolks lightly adherent to the shell were, chemically, slightly lower in quality than were the second-grade food eggs, whereas the sour eggs, white rot, eggs with a green white, and eggs with yolks heavily adherent to the shell showed much more deterioration. Black rot had five times as much ammoniacal nitrogen as any of these types of eggs. With the exception, possibly, of the eggs with yolks lightly stuck to the shell, none of the eggs in these samples would be used by the housewife or reputable baker or confectioner.

EGG PACKAGES.

The shipment of eggs was formerly made in barrels, packed in straw or oats, or in boxes of various sizes, or in buckets, or in any other container that came handy. This state of affairs has been entirely changed, so that it is now the exception to ship eggs in anything but the 30-dozen case, packed with trays and dividing boards.

THE CASES, TRAYS AND DIVIDING BOARDS.

So important is the relation between egg package and the quality and safety of the egg which is transported that a brief statement of some of its more salient points may well be given here.

The best cases are made at the present time of cottonwood. Red gum and white tupelo are used as substitutes for cottonwood because they are slightly less in cost, but they are decidedly inferior for long distance shipping and undesirable when storage is contemplated.

There is a trend toward a slightly heavier case—that is, one having sides, tops and bottoms 7-32 of an inch in thickness as compared with the standard of 3-16 of an inch. There also is an increased interest on the part of the shipper in the quality of the cases which he uses and their assembling, because good material may be so badly assembled that a very poor case results. This is especially true of the center partition, which should be placed and firmly nailed squarely in the center of the case; otherwise one-half of the case is too full and the other not full enough.

The dividing board and trays, or "fillers" and "flats," as they are commonly called, are graded as "No. 2," "Medium," "Three-pound," and "No. 1," the difference being in the weight of the strawboard from which they are made. As sold by the manufacturers, a "set" consists of ten trays and eight dividing boards. As required by the railroads, a "set" is ten trays and twelve dividing boards. It is highly desirable that the filler manufacturers change their present practice to agree with the classification rather than to sell the extra division boards in fifty-pound packages by weight.

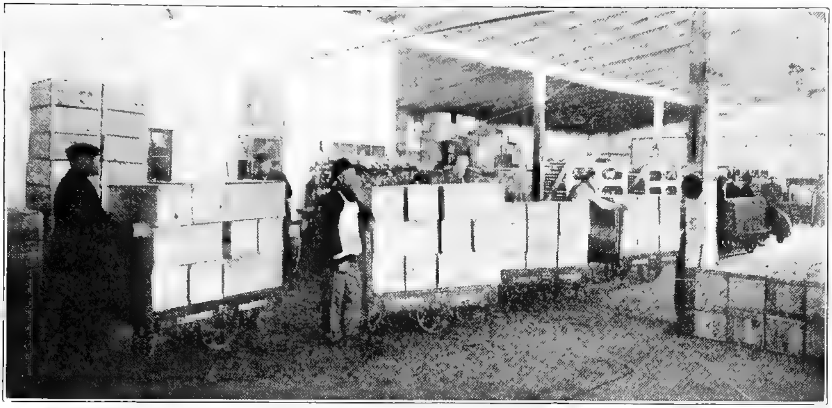
As sold by the manufacturers, the various grades have weights as follows:

No. 2.	2¼ pounds per set of 10 trays and 8 division boards.
Medium. . . .	2¾ pounds per set of 10 trays and 8 division boards.
3 pound.	3 pounds per set of 10 trays and 8 division boards.
No. 1. . .	3¼ to 3½ pounds per set of 10 trays and 8 division boards.

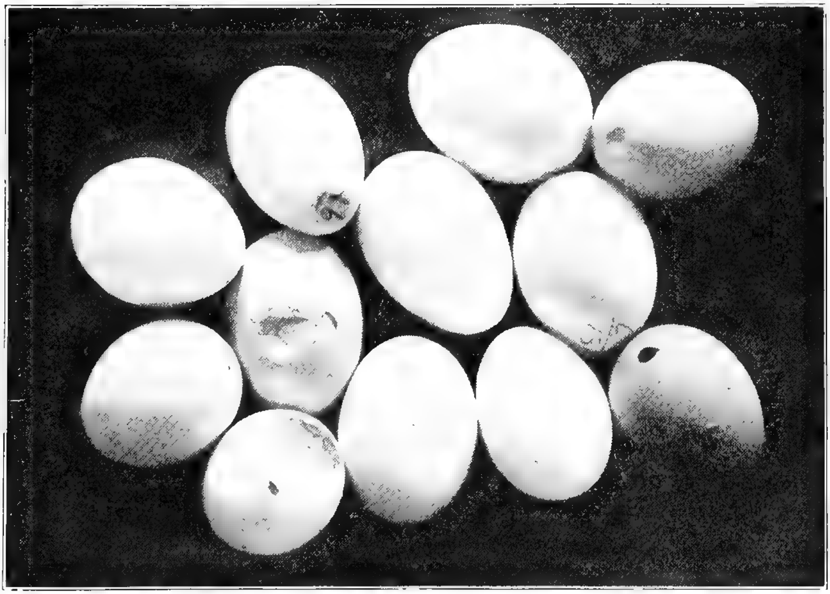
Of course, all these weights should be increased according to the railroad definition of the outfit required, the "medium," for example, weighing with 12 division boards 3 pounds, 2 ounces.

The "No. 2" fillers and flats are highly undesirable and should not be used. Eggs packed in them are not accepted as "standard" by the railroads, and shippers using them and failing to so specify in the bill of lading are liable to prosecution under the law. Such matters are being more and more closely watched by the railroads. The same thing applies to medium fillers which are not up to the required standard, and it is wisdom on the part of the shipper to see that, when thoroughly dry, the fillers he is using are full weight.

The cushions of excelsior, cork, corrugated strawboard and cut straw which the railroads require in the bottoms and on the tops of the cases are a very important item in egg packing, because they tend to make a tight but springy package which withstands shocks. Of the various forms of buffings mentioned excelsior is the most commonly used, but it must be properly placed if they are to be efficient. The quantity of the buffing used must be sufficient to fill the extra space, but not enough to crowd the eggs unduly. It must also be evenly distributed over the surface of the case as shown in figure 8, not as shown in figure 9. The bunch of



A scene in one of the large poultry and egg houses of the Central States. Shows car loads of eggs being handled, graded and prepared for storage and for immediate consumption. Some of these concerns handle millions of dollars worth of poultry products in a single season.



By having a liberal supply of nesting material in the bottom of the nests it is possible to avoid a large per cent of the cracked eggs. Also be careful in handling them and never put a cracked egg in a case. Place a thin layer of excelsior in the bottom of the egg case. Use good fillers and place another thin layer of excelsior over the top before the lid is fastened to avoid breaking in shipping.

excelsior in the middle of the egg space is too frequently seen in our packing houses and markets and is responsible for some of the breakage. The excelsior in the bottom should also be an even layer, with a little extra in the corners.

SAFETY OF EGGS.

A very large amount of the present loss due to damaged shells would be eliminated if the egg shipper would provide a good package and fill and close it with care that a product as valuable as eggs demands and justifies. There are but few products shipped in great quantity which, pound for pound, are as valuable as eggs, yet the egg shippers have consistently cut down the price and quality of the package. There is now, very fortunately, a reversion of feeling, and intelligent shippers are beginning to compute losses and compare them with the slightly increased price of good cases and packing, with the result that the trend is now for quality of package and care in handling. When such a sentiment becomes more widespread, the yearly damage figures will not be so startling.

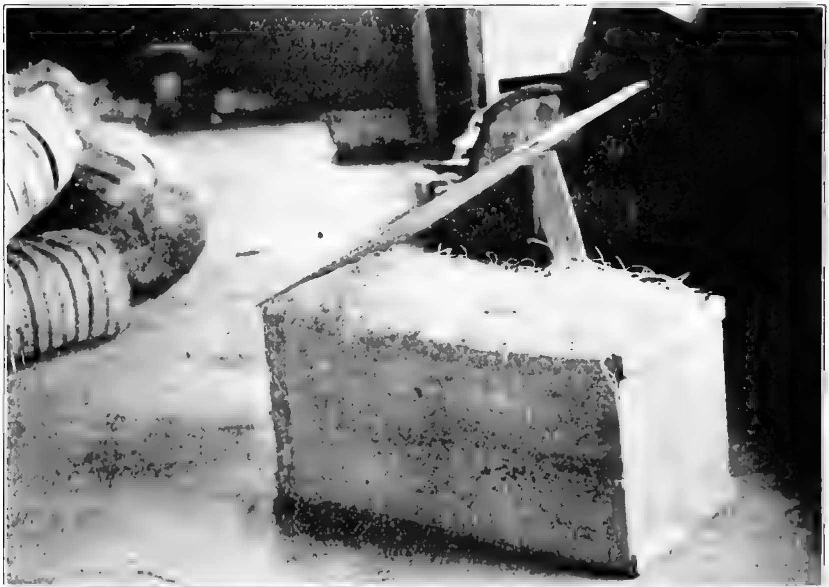


Fig. 8. A standard egg case with excelsior properly distributed.

RAILROAD TRANSPORTATION OF EGGS.

Breakage in transit.—At the present time there is a concerted movement on the part of the railroads and the more careful shippers to discover a way to decrease the breakage in eggs found at the time of unpacking at the consuming centers. If this loss, due to the breakage in transit from the producer to the consumer, can be decreased it will mean an immense saving to the producers, consumers and intermediate handlers.

*According to preliminary investigations carried on by the Food Research Laboratory, United States Department of Agriculture, during 1913, it was found that in presumably sound-shelled eggs 19.22 eggs per case, or 5.34 per cent, leave the packing house with damaged shells. By the time the eggs reach the market the damage caused by trucking, loading and

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*Address by M. E. Pennington, before Missouri Association of Wholesale Dealers in Eggs, Poultry and Butter, Kansas City, Mo., March 2, 1914.

hauling and unloading has increased the shell breakage to 6.94 per cent, or 24.98 eggs to the case.

There are many factors that may cause this loss. Some of them are improper handling by the farmer, storekeeper, hucksters and packer, and the use of inferior cases, weak fillers, faulty loading and rough handling by the railroads.

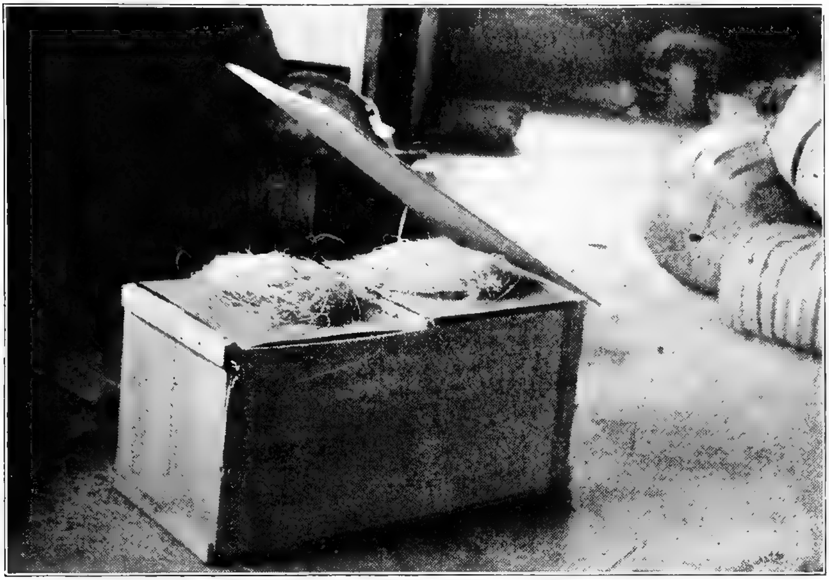

Fig. 9. Placing excelsior in bunches on the top of the case will cause breakage.

HANDLING IN THE PACKING HOUSE.

If good cases and fillers are used, the greatest loss is accounted for by the packer including cracked eggs in the case as sound eggs, or cracking them as they are being packed in cases, and by improper stowing of the load in the car. It is possible for the packer to insure only sound eggs going into the cases by clicking or by candling the eggs to determine which are cracked, and then to pack them in fillers with enough care to prevent the upper eggs from breaking or being broken by the eggs in the lower layers.

LOADING IN CARS.

The chief requirement for the loading of cases of eggs in cars is that the load should be solidly stowed, with the cases all placed lengthwise in the cars, and if any space is left, that the cases shall be strongly braced to prevent shifting. Special care should be taken that there is no walking on the tops of the cases, as the thin veneer is insufficient to protect the top layer from a man's weight. If, for any reason, it is necessary to walk across the cases, a strong board should be laid down as a support for the feet.

The shifting thrust of a load comes lengthwise of the car, and for this reason the load should be tightly packed, so that no shifting is possible. Any extra space in the center of the car that remains after loading should be securely filled by racks at the ends of the cases extending from the floor of the car to the top of the load. If the top layer does not extend the full length of the car, it may be braced by placing strips beneath the cases in the layers below and one row in front of the extra cases, making the strips of sufficient thickness to allow the cleats on the cases in the lower layer to catch the bottom of the ends of the cases in the top layer. This method of bracing is preferable to nailing boards against the side of the cars, as it ties the top layer firmly into the load and prevents any injury to the sides and insulation of the car.

It is desirable during the hot summer months, when using iced refrigerator cars, to get the maximum amount of circulation of air around the cases. For this reason, when using a car which ordinarily holds 8 cases snugly, it is frequently desirable to place but 7 cases on the bottom row, so arranged that air lanes are formed the entire length of the car. This allows the cold air from the bunker to reach the entire length of the car and cool the load. The bottom layer of cases will be securely held by the layers above, provided there are three or more layers in the load and the work is carefully done. This method of loading is practicable only in the hands of competent men.

MIXED CAR LOADS.

Mixed car loads of poultry in boxes or barrels and eggs, including butter as well, are usually difficult to stow and always undesirable. When it is necessary to make such loads, the poultry and butter should be placed at the ends of the car next to the bunkers and the eggs in the center. Each commodity should be separately braced in the car, as a shifting of the heavy boxes would break the weaker egg cases. Placing the poultry in the end of the car insures it receiving the most benefit from the refrigeration, permits the salting of the bunkers and makes loading easier. In some instances where the loading has been such that the eggs were at the ends and the dressed poultry in the center, it has been found that the eggs have been frozen and the poultry green-struck and unfit for food, because the egg cases prevented the cold air from reaching the poultry.

"PICK-UP" CARS.

Refrigerator cars for dairy freight, which pick up dressed poultry, eggs and butter in less than car lots, cause a much greater loss due to damage in proportion to the amount of tonnage handled than in solid or mixed car loads. This is caused by improper stowing of the load by the train crews, rough handling of the car in local freight service, and also by lack of refrigeration due to the frequent opening of the car doors. To prevent the loss it will be necessary to impress upon the train crew that it is handling perishable and breakable commodities, and to see that each car is furnished with a sufficient supply of car racks to allow of thorough bracing of the load.

ICING REFRIGERATOR CARS.

Refrigerator cars intended for the handling of eggs under refrigeration should be iced the day before loading, preferably with crushed ice, in order that the interior of the car may be cold when the cars are loaded. Salting the ice is not advisable because of the danger of freezing the eggs. All of the doors and bunker caps should be carefully examined and made tight to prevent the entrance of heated air. Of course only strong, clean, well insulated cars should be used.

If possible, a thermometer should be hung in the center of the car at the time of icing and the temperature noted as soon as the car is opened for loading, and again the last thing after the loading is completed and the doors are ready to be closed. This precaution marks the careful shipper, and is useful if any subsequent dispute should arise over the car temperature at the time of loading. The car temperature should be below 40 degrees before loading, and, if possible, 35 degrees. A canvas curtain should always be hung across the doorway of the car when loading in hot weather to prevent, as far as possible, the loss of cold air.

In the winter time, when there is danger of eggs freezing in transit, the bunker ends of the car and the door opposite the loading platform should be covered with insulating paper. In addition, at least 4 inches of clean straw should surround the eggs on all sides. The straw on the ends and sides must be tightly packed. It must be remembered that any slight opening into a refrigerator car that is moving in a train will set up a circulation of air that cannot but be detrimental to the car's contents; therefore. care should be taken to see that no openings are left.*

HANDLING EGGS AT CONSUMING CENTERS.

Thus far but little consideration has been given to the handling of eggs after they reach the consuming markets. There is a lack of realization on the part of the handlers that the eggs are a perishable product that deteriorates steadily from the time of laying until consumed, and this deterioration cannot be checked except by proper facilities and due care in handling.

The cause of breakage is rough handling. The hastening of interior deterioration is mainly due to heat; therefore, careful handling and a more extended use of refrigerators must be the two most important factors in the conservation of quality.

In hot weather eggs should be handled under refrigeration from the instant of production until consumption. This cannot be done in the early production and marketing stages, but the subsequent conditions may be greatly improved by a little care and thought in handling. After having once been under refrigeration eggs must be kept there continuously, for if there is a sudden transition from temperatures between 35 degrees and 45 degrees to 60 degrees or 70 degrees Fahrenheit, moisture will condense on the shells of the cold eggs. This moisture destroys the protective properties of the shell against mold and bacterial infection, resulting in rapid deterioration and the final loss of the eggs for food purposes. Therefore, it is desirable that eggs once refrigerated be kept continually in cool temperature without any lapses to higher ones. This means that the railroad warehouses must have refrigerated rooms and the cars must be unloaded directly into such rooms operated by the commission man or jobber. Furthermore, the retailer must keep his supply of eggs in his refrigerator, instead of exposed on the counter or in the show window, and the housewife must place them in a refrigerator until consumed.

EGG CONSERVATION.

Few consumers of eggs ever stop to realize that hens lay eggs to perpetuate their species and not for human consumption as food. This means that the flush period of production will come during that season of the year when conditions are most favorable for the raising of chickens, namely, in the spring and early summer. But we, as eaters of eggs, demand them throughout the year; therefore, the great problem we have to face is that of the preservation of the eggs in good condition from the flush season of production until the time of scarcity. For many years eggs have been preserved in limewater and in a solution of "water glass," but because the former are undesirable for marketing and because the latter are applicable to home consumption only, these methods will not be treated of here.

There are three widely used methods of holding eggs for delayed consumption: First, storage in the shell under artificial refrigeration at temperatures ranging from 29 to 31 degrees; second, the contents are removed from the shell, then, the liquid placed in cans, frozen solidly and held in a frozen condition until used; third, the liquid is dried and dissolved in water at the time of using.

STORAGE IN THE SHELL.

The best method now known for preserving eggs in the shell is by means of artificial refrigeration. During the spring months, when production is heaviest and the quality is best, millions of dozens of eggs are packed with special care in clean cases and fillers and rushed to refrigerated warehouses (page 47 shows the appearance of an egg storage room) where they are stored in cases. These rooms are cooled by means of pipes filled with cold circulating brine or by constantly changing cold air. They remain in these rooms until the scarcity of production in the early fall makes it profitable to sell them. Good eggs kept at temperatures of 29 to 31 degrees Fahrenheit in well equipped cold storages are certain to be good articles of food even after storage of nine to ten months. That the cold storage of eggs in the shell is a matter of holding from a period of overproduction to one of the four months of scarcity is shown by the fact that 49.8 per cent of the eggs in this country are produced during the four months March, April, May and June. During these same months, 86.1 per cent of all the eggs stored during the year are placed in storage. On the other hand, in the four months of October, November, December and January the egg production is only 18.07 per cent of the year's total, while 77.8 per cent of the storage eggs are consumed.*

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*For further information on refrigerator cars see Bulletin No. 17 of United States Department of Agriculture, "The Refrigeration of Dressed Poultry in Transit."

FROZEN EGGS.

Even if all the eggs produced were from well kept and well bred hens, and if they were well handled, there would still be need of preserving eggs out of the shell in a hard frozen condition. As the trade is now, small eggs, or eggs with dirty or cracked shells, are seldom profitable if marketed during the season of production, but are highly desirable if held in an unaltered condition until winter time. Eggs which have become slightly stale frequently deteriorate during the haul to market to such an extent that they are unfit for human food. Eggs of the foregoing grades do not keep well if cold-stored in the shell. Hence they are released from the shell, placed in tin cans and immediately frozen.

The conditions under which eggs should be prepared for freezing are described in publications of the Department of Agriculture*, which should be consulted for the details of this industry. The product is used almost exclusively by bakers.

DESICCATED EGGS.

Eggs in a dry form are more stable than in the shell or hard frozen; hence they can be used on shipboard, in tropical climates, in the far north and wherever stability and decreased bulk and a lack of refrigeration are important considerations. After removing the egg from the shell with all the precautions pertaining to the preparation of eggs for freezing, the well mixed liquid is evaporated until about ten per cent of water remains. Generally a flaky powder results. Yolks of eggs and whole eggs are dried in this country; dried egg white is made in central Europe and China.

MARKET GRADES OF EGGS.

In spite of the fact that eggs are produced almost universally over the country and that some production occurs the year around, there are periods when certain localities depend for their egg supply upon regions which are far distant. The various producing quarters may ship north, south, east or west, as the season or demand indicates, finding in these different markets not only different prices but also different standards of quality and different forms of grading. Among all this variation, however, one practice has become universal, namely, the use of the 30-dozen egg case as the unit package. So absolute has its sway become that the individual farmer often holds back his eggs until he can take a filled 30-dozen case to market, and the largest sales in eggs are reckoned by the number of such cases. From this habit of thinking in terms of the 30-dozen case, rather than in dozens or individual eggs, there has developed a system of egg grading in large cities—which are receivers only—by considering the whole 30-dozen eggs as a unit, and of affixing the quality of the whole case by the proportion of the highest grade eggs in it.

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*Bulletin No. 93, United States Department of Agriculture, "Cold Storage Business Features," and Bulletin No. 101, "Cold Storage and Prices."

**See also Part 1, pages 47 to 49.

***Circular No. 98, Bureau of Chemistry, and Bulletin No. 51, United States Department of Agriculture.

It can readily be seen how such a custom could develop in receiving markets, because in the past many shippers have bought eggs on a basis which is economically much more unsound, namely, "case count," where every egg received an equal price regardless of equality; and very often shippers failed to make any attempt to grade the eggs which they shipped to the cities, but, knowing that they had paid a certain sum per 30 dozen, they reckoned their return in like fashion.

As the value of eggs has increased, as the industry in the heavy producing section has become more skilled in handling and marketing the product, there has arisen not only a widespread refusal to pay anything for worthless eggs, but in many places, also, a very definite system of buying on a quality basis whereby large, clean, fresh eggs bring the highest price quoted, with small, stale, dirty and cracked eggs carrying their own respective but lowered prices. Such a system of buying is economically sound, and it is encouraging to observe in the financial success of those adhering to this fundamental principle the agreement of theory and practice.

The receivers in the cities have always sold on a quality basis, and now when the traffic in eggs is becoming more and more complicated because of sales from one city to another, as well as from the primary concentrator, the need of a definite and generally accepted system of market grades is an absolute necessity.

From this necessity for grades for traffic between receivers and because of an awakened and more intelligent interest on the part of the country shipper in the increased returns to him, due to a higher quality output, an attempt has been made to unify and systematize the qualities of eggs commonly received in markets, hoping that some such system of grading will prevail in all markets, thereby greatly facilitating the sale of eggs, no matter from whence they come nor how many times they change hands. The best attempt at such a uniform classification has been formulated by the National Poultry, Butter and Egg Association and published in its handbook for 1913-14. A copy of these rules follows:

EGG RULES.*

Fresh Gathered or Refrigerator.

"For commercial purposes they shall be subgraded as: National extras, national firsts, national seconds, national thirds, national dirties, national checks.

"In addition, the terms fresh gathered, storage packed or refrigerators shall be used to describe more fully according to particular seasons or as the occasion requires.

"What Constitutes Loss—Total loss shall comprise all rotten, broken (leaking), spots, broken yolked, hatched, (blood-veined) and sour eggs.

"What Constitutes Partial Loss—Very small, very dirty, cracked (not leaking), badly heated, badly shrunken, salted or frozen eggs shall be counted one-third loss in all grades excepting thirds, dirties and checks.

"Fresh gathered national extras shall be packed in new or standard 30-dozen cases (by standard is understood cases that will be accepted by the railroad as entitled to lowest freight rate); shall consist of clean, fresh, reasonably full, strong, sweet eggs as follows:

From January 1st to February 15th, 80 per cent and net weight 43 pounds and over.

From February 16th to May 15th, 90 per cent and net weight 44 pounds and over.

From May 16th to October 31st, 80 per cent and net weight 43 pounds and over.

From November 1st to December 31st, 70 per cent and net weight 43 pounds and over.

"The balance, other than the loss, may be defective in strength or fullness, but must be sweet. There may be a total average loss of one dozen per case, and of this average loss the loss in bad eggs must not exceed one-half dozen. If the total average loss exceeds one dozen by not over twenty-five (25%) per cent, the eggs shall be good delivery upon allowance of the excess.

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*Handbook of the National Poultry, Butter and Egg Association—1913-14.

"Fresh gathered national firsts shall be packed in new or standard 30-dozen cases, shall consist of clean, fresh, reasonably full, strong, sweet eggs, as follows:

January 1st to February 1st, 70 per cent and weigh 42 pounds and over net.

February 16th to May 15th, 85 per cent and weigh 43 pounds and over net.

May 16th to October 31st, 70 per cent and weight 42 pounds and over net.

November 1st to December 31st, 60 per cent and weigh 42 pounds and over net.

"The balance other than the loss, may be defective in strength or fullness, but must be sweet. The dead loss in bad eggs must not exceed one dozen per case and the total average loss must not exceed two dozen per case, but if the total average loss does exceed the amount by not over twenty-five (25%) per cent, the eggs shall be good delivery upon allowance of the excess.

"Fresh gathered national seconds must be packed in new or standard 30-dozen cases, shall be reasonably clean, and shall consist of fresh, reasonably full, strong, sweet eggs, as follows:

From January 1st to February 15th, 65 per cent.
From February 16th to May 15th, 75 per cent.
From May 16th to October 31st, 50 per cent.
From November 1st to December 31st, 50 per cent.

"The balance, other than loss, may be defective in strength or fullness but must be sweet. There may be a total average loss of three dozen per case, but of the total average loss the loss in bad eggs must not exceed 1½ dozen per case. If the total loss exceeds three dozen by not over twenty-five (25%) per cent, the eggs shall be good delivery upon allowance of the excess.

"Fresh gathered national thirds shall consist of current receipts of stock as received from the farmer, huckster or merchant, packed in new standard or shipping cases, and shall contain the following per cent of fresh, reasonably full, sweet eggs:

January 1st to May 15th, 50 per cent.
May 16th to December 31st, 40 per cent.

"The balance, other than the loss, may be defective in strength or fullness, but must be sweet. There may be a total loss in bad eggs not to exceed 2½ dozen per case, but the total average loss must not exceed five dozen.

"Storage-packed shall be the term applied to eggs put up for storage. They must be packed in new thirty-dozen white wood cases unless otherwise specified. The fillers must be new and dry No. 1 or medium strawboard with flats or excelsior cushion over top and under bottom layers. Corrugated flats may be used on top but not in the bottom of the cases. The padding must be kiln-dried exceslior or cork shavings on top and bottom of each case; no pine excelsior must be used. Any car of storage-packed eggs in which washed eggs are found will be deemed as not fit for storage and will be reported "no grade"

"Storage-packed national extras shall contain from March 15th to June 30th ninety (90%) per cent and for balance of year eighty (80%) per cent of clean, full, fresh, sweet eggs, and must weigh net 44 pounds and over. The total average loss may be one dozen, but of this there must not be over one-half (½) dozen checks per case, nor more than three bad or broken eggs. If the loss exceeds this by not over twenty-five (25%) per cent, the eggs shall be considered good delivery upon allowance of such excess.

"Storage-packed national firsts shall grade as follows:

From May 15th to May 31st, 85 per cent fresh, full, 43 pounds and over net weight.

From June 1st to August 31st, 70 per cent fresh, 42 pounds and over net weight.

"The total average loss must not exceed one and one-half dozen; and of this total loss there must not be over twelve checks per case, and the bad and leaky eggs must not exceed one-half dozen. If the total average loss exceeds this amount by not more than twenty-five (25%) per cent, the eggs will be good delivery upon allowance of the excess.

"Storage-packed national seconds shall grade as follows:

From March 15th to May 31st, 75 per cent fresh, full, 42 pounds net weight.

From June 1st to August 31st, 50 per cent fresh, full, 41 pounds net weight.

"The total average loss must not exceed three dozen, of which there must not be over one and one-half dozen checks per case and not more than one dozen rots, spots or leakers. If the total loss exceeds three dozen by not over twenty-five (25%) per cent, the eggs shall be good delivery upon allowance of the excess.

Refrigerator eggs shall be the term applied to storage-packed eggs that have been or that are now in storage. In making offerings of this class of eggs, they shall be further designated by stating the month in which they were stored, and the storage certificate shall be taken as prima facie evidence of the day and month when stored. The storage house must also be stated, and, unless otherwise specified, the storage charges for the season must be paid by the seller.

"Refrigerator national extras must be sweet and reasonably full. Must weigh 43 pounds and over net, and the total loss must not be over one and one-half dozen, of which not more than six eggs may be rots, spots or leakers. If the total loss exceeds one and one-half dozen by not over 33 1-3 per cent, the eggs shall be good delivery upon allowance of the excess.

"Refrigerator national firsts must be sweet and reasonably full. Must weigh 42 pounds and over net, and the total loss must not exceed two dozen per case, of which not more than nine eggs may be rots, spots, or leakers. If the total loss exceeds two dozen by not over twenty-five (25%) per cent, the eggs shall be good delivery upon allowance of the excess.

"Refrigerator national seconds must be sweet and reasonably full and weigh 40 pounds and over net. The total loss must not exceed three and one-half dozen, of which not more than one and one-half dozen can be rots, spots and leakers. If the total loss exceeds three and one-half dozen by not over twenty-five (25%) per cent, the eggs shall be good delivery upon allowance of the excess.

"No. 1 dirties shall be packed in new or standard 30-dozen cases. Must be of useful quality and free from musty eggs. The loss in rots and spots per case and not more than one dozen checked or cracked eggs per case.

"No. 2 dirties shall be packed in new or standard 30-dozen cases. Must be of useful quality and free from musty eggs. The loss in rots and spots must not exceed two dozen and the loss in checks or cracked must not exceed one dozen per case.

"When sold as storage-packed No 1 or No. 2 dirties must be packed in the same way as other eggs packed for storage.

"Refrigerator No. 1 dirties shall correspond to No. 1 dirty storage-packed, but allowing for a total loss of two and one-half dozen, and one and one-half dozen rots and spots and one dozen checks.

"Refrigerator No. 2 dirties shall correspond to No. 2 dirty storage-packed, but allowing for a total loss not to exceed four dozen, two and one-half dozen rots and spots and one an done-half dozen checks.

"National trade eggs shall be the term applied to a grade of eggs consisting of small, clean stained or slightly dirty eggs packed in new or standard 30-dozen cases. They must be sweet flavored, with total loss of not over one dozen spots and rots and one dozen checks per case.

"When offering eggs for sale sellers must specify the state where eggs offered were produced and packed.

"A car load shall consist of 380 to 400 cases, unless otherwise specified.

"The following number of cases shall be necessary to constitute an inspection:

Lots of 100 cases or less	5 half cases
Lots of 100 to 300 cases	8 half cases
Lots of 300 cases and over	10 half cases

"In sales of car lots, if the inspector, after opening the covers of ten half cases, finds that five or more cases are badly damaged, necessitating the overhauling or rehandling of the car, the inspector shall notify the person applying for the inspection of the condition either by telephone or telegram.

"Buyers of car lots on track shall be allowed one day to unload after delivery is made, and, in case of car lots demurrage, the seller shall pay the demurrage for one day after the delivery is tenderd so as to allow for unloading.

"Every lot or mark must be inspected as a separate lot and must not be lumped as one lot or shipment.

"The fees for inspection shall be:

Lots of 100 cases or less	$1.25
Lots of 100 to 300 cases	3.25
Lots of 300 cases and over	4.25

Certificates of inspection for all classifications except refrigerator eggs shall be good for five days after date of issue, provided eggs have been properly taken care of during the interval. Certificates of inspection for refrigerator eggs shall be good for ten days after date of issue, provided eggs remain in same room in same warehouse and have received proper care since they were inspected."

SELLING ON QUALITY BASIS.

The foregoing rules are decidedly a step in advance when viewed in the light of the chaotic conditions now prevailing. But because their trend is in some essentials quite different from the trend of education and extending practices in the producing districts, it may be well to consider them from that viewpoint, and also in the light of what seems to be the line of development of the egg industry in this country.

The producers and concentrators are learning that buying on a quality basis implies selling on a like basis, which necessitates uniform and careful grading. The farmer who brings to the concentrator 30 dozen large clean, fresh eggs receives a greater amount of money than he would have received for 20 dozen large, clean, full eggs, 5 dozen small and heated eggs, 25 dozen dirty eggs, nine spots and nine leakers. Yet the concentrator may, during the fall, remove from the farmer's case 9 dozen of his high quality eggs, substitute the lower grades of eggs as above outlined and still exact from the receiver the prevailing price for National Extras Should the concentrator send the entire 30 dozen high quality eggs to market he would receive just the same price as though he had included 20 per cent of eggs of a lower grade.

Grading in country districts has in the past been so inexact that an allowance for mistakes may have been justified. But this condition is lessening, and if the packer can grade 20 or 21 dozen accurately he can also grade the remaining 9 or 10 dozen and have a very definite idea of the grade of eggs he is shipping. For the retail trade of the cities the city receiver must, under any circumstances, regrade in accordance with the demands of his customers.

It would encourage the country shipper to send a greater proportion of high quality eggs to market if he were paid in accordance with the number of eggs of each grade in the case. On some such buying basis as the above the grades for sale might be outlined as follows for fresh-gathered, storage-packed and refrigerators.

Extra—An egg that is clean, fresh, full, firm and sweet, weighing at least 2 ounces, or 24 ounces to the dozen, or 45 pounds net to the case.

First.—An egg that is clean, reasonably full, reasonably firm and sweet, weighing at least 2 ounces, or 24 ounces to the dozen, or 45 pounds net to the case.

Second.—An egg that is reasonably clean, reasonably full, sweet, may show slight heat, and weighs at least 22 ounces to the dozen.

Third.—An egg that is slightly dirty, shrunken, heated, or may be less than the rate of 22 ounces to the dozen.

Dirty.—An egg that is as good as a first but dirty.

No. 2 Dirty—An egg that is as good as a second but dirty.

No. 1 Check.—An egg that is as good quality as a first, may be cracked but must not be leaking.

No. 2 Check.—An egg that is as good as a second, may be cracked but must not be leaking.

No Grade Egg.—All eggs below thirds.

Loss.—All rotten, stuck spots, moldy, blood ringed, or leaking eggs.

On this grading an inspection report might read that the lot contained, for instance: Twenty-four dozen extras; 2 dozen firsts; 1 dozen seconds; 2 dozen thirds; ½ dozen No. 1 checks; ½ dozen loss to the case.

The principles of this scheme of grading are the same as are in use by many buyers in the producing section, and to extend the same principles to the consuming center would result not only in a better quality egg on the market, just as it is resulting in a better egg in the country, but the simplicity and straightforwardness of the trading would tend to eliminate much of the doubt and distrust that now prevails between the shipper, the receiver and the general public.

A system based on these principles would be ideal if it could be carried to its logical conclusion, namely, uniformity of grades throughout the country. It would not conform to the present practice to so lower the grade during certain seasons that approximately the same proportion of "extras" and "firsts" shall be on the market the year through. Such a practice is, however, absolutely arbitrary, because even the freshest, best-handled eggs of the summer are not as firm bodied as those produced in the early spring, hence the term "first" or "extra" is not absolute, but on a sliding scale which follows the season or the weather.

As careful and intelligent candling becomes more prevalent in the country districts, and as colored sketches, charts and descriptions of eggs disseminate a more uniform terminology in country and city alike, it is reasonable to suppose that the market differences in egg grading now prevailing will materially lessen.

Whether such an ideal condition as is here outlined can ever predominate only time can tell. Modern business, however, demands simplicity for the sake of economy, and for that reason, if for no other, it is highly probable that the evolution now going on in the egg trade will result in a series of grades which are so simple and yet so comprehensive that they will serve for producer, concentrator and distributor.

CANADIAN REQUIREMENTS FOR GRADING AND MARKING EGGS.

We do not believe that any other country has made such rapid progress in getting their poultry and eggs graded and classified as our Canadian friends on the north. It has done a lot to stimulate the production of a high quality article in that country. It is a part of their law, and their grades and classifications are as follows:

Regulations Made Under the Provisions of the Live Stock and Produce Act, 7-8 George V, Chap. 32, Respecting the Grading and Marking of Eggs.

1. Canadian eggs for export out of Canada and eggs for domestic consumption intended for shipment from one province to another, but not including eggs intended for incubation, shall be classified and graded as follows:

Class (1).—Fresh eggs which have not been held under refrigeration at a temperature of 40 degrees or less except when in transit or subjected to artificial preservation.

Grade (a) Specials—Eggs of uniform size, weighing 25 ozs. to the dozen or over or 47 pounds net to the 30-dozen case; clean and free from stain, strong and sound in shell; air cell small, not over 3-16 of an inch in depth; white of egg to be firm and clear and yolk dimly visible.

Grade (b) Extras—Eggs of good size, weighing at least 24 ozs. to the dozen or 45 lbs. net to the 30-dozen case; clean; sound in shell; air cells less than ⅜-inch in depth; white of egg to be firm and yolk slightly visible; maximum allowance at time of inspection not to exceed 2 p. c. variation from the grade stated.

Sub-grade (1) Pullet Extras—Eggs which have the quality of extras but which fall short in weight shall be known as pullet extras providing they weigh at least 20 ozs. to the dozen or 37½ lbs. net to the 30-dozen case.

Grade (c) No. 1's or Firsts—Eggs weighing at least 23 ozs. to the dozen or 43 lbs. to the 30-dozen case; reasonably clean; sound in shell; air cells less than ½ inch in depth; white of egg to be firm; yolk may be distinctly visible but mobile; air cell stationary; maximum allowance at time of inspection not to exceed 2% variation from the grade stated.

Grade (d) No. 2's or Seconds—Eggs sound in shell; may contain weak watery eggs and eggs with heavy yolks, and all other eggs sound in shell and fit for food.

Class (2) Storage eggs which have been "held" under artificial refrigeration at a temperature of 40 degrees or less.

Class (2a) Preserved eggs which have been subjected to any process, liquid or otherwise, intended to preserve their quality.

Grade (a) Extra eggs of good size, weighing at least 24 ozs. to the dozen or 45 lbs. net to the 30-dozen case; clean; sound in shell; air cell not less than ⅜ inch in depth; white of egg to be firm and yolk slightly visible; maximum allowance at time of inspection not to exceed 2% variation from the grade stated.

Grade (b) Extra Firsts—Eggs weighing at least 23½ozs. to the dozen or 44 lbs. net to the 30-dozen case; clean; sound in shell; air cell less than ⅜ inch in depth; white of egg to be firm; yolk may be moderately visible but mobile; air cell stationary; maximum allowance at time of inspection not to xceed 2% variation from the grade stated.

Grade (c) No. 1's or Firsts—Eggs weighing at least 23 ozs. to the dozen or 43 lbs. net to the 30-dozen case; reasonably clean; sound in shell; air cells less than ½ inch in depth; white of egg to be firm; yolk may be distinctly visible but mobile; air cell stationary; maximum allowance at time of inspection not to exceed 2% variation from the grade stated.

Grade (d) No. 2's or Seconds—Eggs sound in shell, may contain weak watery eggs and eggs with heavy yolks, and all other eggs sound in shell and fit for food.

Class (3) Cracked and Dirty—Eggs, shells of which have been checked or broken, smeared, soiled, or damaged in shell, but fit for food.

2. Every case containing Canadian eggs intended for export out of Canada shall be marked on both ends in a legible and indelible manner, with the class and grade of eggs contained therein, and the words "Canadian Eggs," and every case containing eggs that are to be shipped from one province to any other province in shipments of 100 cases or more, shall be marked on both ends with the class and grade of the eggs contained therein, and with the name of the country of origin when other than domestic products. The Minister may from time to time prescribe the form and the size of the letters that are to be used in such markings. Such marks may be accompanied by other trade designations or brands, providing such designations or brands are not, in the opinion of the Minister, inconsistent with or marked more conspicuously than the marks prescribed in these regulations.

3. Canadian eggs for export out of Canada shall be tightly packed in Canadian standard cases in new white fillers and flats, with kiln dried excelsior or corrugated cushions at top and bottom, or one-third fillers on bottom with flats over top and under bottom fillers.

4. Canadian standard cases shall be made to contain thirty dozen eggs. They shall be made of clean, dry and odorless wood. The ends and center partition shall be not less than five-eighths of an inch thick, the sides, top and bottom not less than three-eights of an inch thick.

5. Cases containing Canadian eggs in lots of twenty-five cases or more intended for export out of Canada, and eggs intended for shipment from one province to another province in shipments of 100 cases or more, shall

not be shipped until they have been inspected and marked by an inspector.

6. The mark of approval to be placed on each case, hereinafter called the "Government Mark," shall include the Maple Leaf and the words "Canadian Eggs," and "Government Inspected" together with the Inspector's number, the device to be in such form as the Minister may approve.

7. Before the government mark is placed upon any case, the inspector shall draw samples of at least five per cent of the cases to be marked and shall examine at least one-half of the eggs in each case. The Inspector shall satisfy himself that the samples taken are representative and shall take any further samples and make any further examination that he deems necessary.

8. No cases containing eggs shall be marked with the government mark unless the warehouses or rooms in which the eggs are held are in a clean and sanitary condition, and further, no cases shall be marked unless suitable accommodation is provided for inspectors to make the necessary examination, such accommodation to include a dark room, facilities for candling, and such fittings as may be required to insure a proper examination.

9. No person other than a duly appointed inspector shall apply any government mark to any cases containing eggs.

10. After the contents of any case bearing the government mark have been removed, such mark shall be obliterated. This shall be done by the person or persons removing the eggs from the case.

11. Collectors of Customs throughout Canada shall not allow any Canadian eggs to be shipped for export out of Canada that are not marked in accordance with these regulations.

THE POULTRY INDUSTRY FROM THE DISTRIBUTORS STANDPOINT.

Before preparing this lesson I called upon Mr. W. T. Seibels, business manager of the National Poultry, Butter and Egg Association, to give me some suggestions as to the points upon which most stress should be laid in putting the question of "Market or Commercial Eggs" properly before the public. Mr. Seibels is a man of wide experience and has studied market poutlry conditions and methods very extensively both in this country and abroad. This is his reply:

It is a difficult undertaking to visualize and express what several thousand people in any important branch of a big industry see and think. Too often individuals here and there undertake to do this, and because their vision is obscured or because their judgment is warped owing to incomplete data or assumed facts there is trouble to follow. Hence I am a bit skittish of my position in being too outspoken in saying what some others might feel safe in setting forth.

I make the foregoing statement advisedly and in all seriousness for the simple reason that the poultry industry is as big as all out of doors and it has so many angles to it we had just about as well try to make up a paragraph showing what the weather conditions will be six months or a year hence as to try to forecast the drift of our affairs. Forsooth, there are variable factors which govern the weather, and it is equally true that there are any number of variables which can and do crop up periodically and which set at naught the very best guesses we poor mortals may make about the distribution of poultry and eggs.

Of course, the subject you refer to is capable of almost infinite treatment, because standardization of our products has not kept pace with the growth and importance of our industry. Too many people look at eggs as simply being eggs and not having due regard for those essential points which go to differentiate quality and determine value both from the standpoint of the producer and the consumer. The middleman is simply forced to buy and sell whatever kind of product he finds available.

One big feature which I think ought to be emphasized more and more is that weight is an important factor, and one which will certainly become more important in fixing the value of eggs to the producer and the consumer in the near future. And if weight is given its due we will presently discover that it is not the hen which lays so many eggs but the hen that lays good meaty eggs. I have heard it stated by practical men that the heavier weight bird may not lay as many eggs in number during a given period, but that in the end the weight of her product would equal if not exceed the weight of the lighter bird.

In these days when people are coming to figure more closely on their purchases and are seeking to get the last penny of value in foodstuffs I cannot but feel that in the very near future we will see eggs selling by weight instead of numerical count. I think it is the fairest and best method for all parties concerned.

Practically all grading rules contemplate weight as a factor, and I would not be surprised to see some legislation on this subject if it cannot be handled in any other way.

Another thing of great importance from the standpoint of the entire country is to improve the commercial pack and to cut out the term "current receipts" entirely and substitute some other name or names which will more nearly represent what grade or quality is in a given package. I do not think that grades should be made so complex that the average person would have difficulty in using definite terms. These grades, of course, should apply from producing sections to storing centers. I am absolutely sure that they could be used universally if everyone wil simply adopt them and go to using them. There is entirely too much camouflage in the handling of eggs at present, for the wholesale dealer often buys "current receipts" which ought to be rehandled and put up in shape to sell at a higher price, and which could easily be realized if the defective eggs were removed and the cases were properly packed.

The present slipshod methods give rise to an enormous economic loss to the entire country, and for which nobody benefits, but on the contrary everybody suffers.

I believe the majority of those engaged in the distribution of poultry and eggs are not only patriotic but that they are thorough patriots and that they welcome regulations seeking to curb excessive profits and prevent injurious speculation, provided those things have ever applied to our trade in a degree which justified apprehension. And while I have this thought in mind I want to call your attention to the fact that the selling of future contracts on our leading exchanges was abolished voluntarily even before the present Food Control Law was passed. I may say further that this step was not taken because anyone believed either the producer or the consumer was injured when a bona fide future sale was made, but it was done in order to clear up any grounds for the charge of profiteering or injurious speculation. About the strongest possible proof that could be advanced to show that the stopping of future trading could not and cannot permanently influence values is that prices since future sales were discontinued have gradually advanced in keeping with the upturn in practically all commodities, which, as Mr. Hoover pointed out over a year ago, is sure to be one of the inevitable economic changes growing out of the war. It is far from my purpose to provoke any discussion here or hereafter regarding future trading, but when we are again returned to normal conditions I trust that some of our would-be reformers who apparently haven't even a speaking acquaintance with the underlying principles that govern the making and breaking of markets, will have learned that the identical principles which apply to the selling of wheat, cotton, coffee, meats, sugar and what not will have to be applied to those other enormous agricultural products, to-wit; poultry and eggs.

I am thoroughly convinced that a great many people haven't a clear conception of what the poultry and egg crops really mean. Gentlemen, we have a billion dollar proposition for the simple reason that we have a billion dollar country. Statistics are not as complete as we would like, but we know absolutely that the value of the egg crop to the producer is well above $600,000,000 a year, and the value of the poultry crop is certainly more than enough to boost the total above the billion mark. Some time ago, I felt the necessity of preparing a particular exhibit to be used in a case before the Interstate Commerce Commission, and relying upon figures compiled by the U. S. Census Bureau, coupled with the actual prevailing market prices, we found in distributing centers the wholesale value of eggs in 1917 to be upwards of $725,000,000. Transportation charges on the movement of this enormous crop will be in the neighborhood of $15,000,000 this year, for we know by careful calculation that the average transportation is around 50 cents per case and that fully half of the more than 60,000,000 cases produced move into commercial channels.

The value of the commercial poultry crop is not so easy to figure out. We know that Greater New York uses upwards of twenty-five million dollars' worth of live poultry per annum, and it is estimated that fully as much more dressed poultry is consumed in that market. In other words, New York's bill for poultry is at least $50,000,000 a year. Now then, on the basis of per capita percentage we know that New York's indicated requirements are about one-fourth of the entire Trunk Line territory which justifies us in stating roughly that our population east of the Pittsburgh-Buffalo line to seaboard and north of the Potomac requires approximately two hundred million dollars' worth of poultry every twelve months. The population in the territory just mentioned is only one-third of the entire country. Therefore, we are probably justified in saying that in these good United States we eat six hundred million dollars' worth of poultry annually.

Mind you, I am not jumping at any of these conclusions, and I am morally certain that when we have better statistics we will not only verify everything I have just stated, but we will be amazed to find that all estimates heretofore have erred in that they have been too conservative.

Perhaps I am digressing a bit in calling your attention to these figures and if so, I crave your pardon. But I insist that we must get clearly in mind the fact that we are dealing with a proposition which involves millions and hundreds of millions of dollars before we can lay claim to the breadth of vision to deal even with subsidiary questions which are perforce interwoven with a billion dollar industry that has simply grown up and spread all over creation without anyone knowing much about it. I am not joking when I tell you that only a few years ago practically nobody knew anything worth while of the economic value of poultry and eggs, for our soothsayers, statesmen, college professors and newspaper writers—taking them by and large—were disposed to let the hen shift for herself and to practically disregard her as a source of food supply. But with what statistics are available we now know that the hen and her products represent the equivalent in value of one-twelfth of our entire agricultural crops.

The meer fact that we can define these values and express them even in a general way gives us a tremendous leverage in mapping out our program for the future and we should use this information; moreover, we should add to it and verify related data as they become available hereafter. We should go farther than this and present certain interesting facts to the consuming public as to the value of poultry and eggs from the standpoint of their food equivalents, not so much because we want to detract from the value of other foods, for there is plenty of room for all good foods now and hereafter. My idea is to clear up in the public mind some doubts which have been created by reason of unfair advertising of certain other food products, and also to prove that eggs and poultry represent good food values at whatever they may be selling for alongside competitive products.

Again, you may think I am digressing when I speak of our interest in production. Gentlemen, I believe the distributor is coming to realize as he has never before that he has a very direct intrest in production. And why not? It is perfectly obvious that unless production is kept up there would soon be nothing to distribute and again we should see that Othello's occupation was gone. Per contra, I hope that the producer has learned by now that without the distributor, he, the aforesaid producer, would have little incentive to keep on producing beyond what might be required for local use. Going a step farther, I rather think that before long the consumer will see very clearly that he is dependent in a large measure both on the producer and the distributor and just as dependent on the distributor as on the producer, for all thinking people who have studied the question impartially must realize that the present machinery of marketing is the outgrowth of years of experience and that it is indeed the quickest, safest, and most economical method of taking this billion dollar crop, providing the enormous financial accommodations to handle it, to store it and to distribute it at such times, and at such places and in such quantities as the whims of the weather and caprice of the consuming public may dictate.

I believe I am justified in saying that we seek your counsel and cooperation in helping to serve our common country. The poultry industry is big—too big for any one branch of it to try to regulate it all.

It is only by constructive planning, by constant effort, genuine cooperation—live and let live policy—that we can accomplish our aims fully.

I confidently believe we are facing the sunrise of a better day, and feel sure this great movement looking to a real federation of our gigantic industry is sure to bring results which will make us all feel a thrill of genuine patriotic service within the very near future.

THE COMMERCIAL EGG BUSINESS. LESSON NO. 29.

1. What are the three most common methods of selling eggs?
2. What are some of the difficulties often encountered in building up a private trade with private families, hotels or cafes?
3. In shipping eggs to commission merchants and jobbers, what are some of the things which it will pay us to give some consideration?
4. What will be the effect on eggs if they are allowed to remain on side-walks, depot platforms, or in other places where they might be exposed to the hot sun while on the road to market?
5. What is meant by buying eggs "case count," by "loss off," by "quality basis?"
6. In what way does a well regulated cold storage plant act as a balance wheel to the egg industry?
7. What are two of the greatest disadvantages in shipping eggs by parcel post to private trade? What is the best method of preserving eggs for home consumption?
8. Mention briefly three of the most important things which should be understood between the producer and purchaser where eggs are being sold to private trade.
9. For what defects should eggs be disqualified?
10. Which is of the most importance in judging eggs—shape, uniformity and shell texture, or the quality of the white and yolk? Why?
11. What qualities of an egg either exterior or interior, may be determined by inspection? What by candling?
12. What is meant by a "blind check?" By a "leaker?"
13. What is the most important part of an egg candling room?
14. How does a fresh egg appear before the candle?
15. What is the cause of eggs having settled yolks?
16. What is the cause of eggs having movable air cells?
17. What causes moldy eggs? How prevented?
18. What is the difference in appearance of White Rot eggs and Black Rot eggs, before the candle?
19. What can you say of the proper distribution of excelsior over the bottom and top of egg cases?
20. What three methods of holding eggs for delayed consumption are used by dealers and packers?

INDEX

PART ONE

THE PRODUCTION AND HANDLING OF MARKET EGGS

Page

A High Grade Product Sells Itself.... 2
Articles of Constitution Governing New England Poultry Producers' Exchange.... 51-55
A Year's Hen Rations.... 27

Breeding to Improve the Quality of Eggs.... 8

Composition of Hen Eggs.... 3
Causes of Loss.... 20
Confine Broody Hens.... 15
Co-Operative Egg Marketing Associations.... 44-46
Cost of Marketing Eggs.... 55
Cost of Producing Eggs.... 24

Dealers Should Buy on Quality Basis.... 32
Delays in Marketing.... 34
Dirty Eggs.... 16

Egg Crop, The.... 63
Egg Record.... 6
Eggs a Finished Product.... 19
Encourage Cold Storage of Eggs and Local Cold Storage Plants.... 36
Exhibiting and Judging Eggs.... 41-44

Factors Determining Shape of Egg.... 21
Factors of Cost of Marketing Eggs and Typical Operations.... 56-63
Facts to Bear in Mind.... 19
Feed Important.... 6

Gather Eggs Often.... 12
Grade Eggs Carefully.... 15

Handling Eggs on the Farm.... 10
How to Prevent Loss.... 18
How to Produce the Highest Grade of Market Eggs.... 4

Incubator Eggs.... 12
Influence of Ration of Weight of Eggs.... 7
Internal Factors Affecting Quality of Eggs.... 21
Introduction.... 1
Is Cost of Production Robbery?.... 26

Keep Eggs in Cool Place.... 15
Loose Shell Membrane.... 24

Market Egg Situation.... 1
Market Eggs Often.... 17
Methods of Selling.... 30

Necessity of Proper Housing, The.... 8
New England Poultry Producers' Exchange.... 46-51

Ovarian Conditions.... 22
Oviduct Conditions.... 22

INDEX—Continued

Page

Percentage of Egg Crop Each Month........ 24
Percentage of Loss in Bad Eggs on Farm........ 21
Preserving Eggs for Winter Use........ 35
Provide Clean, Roomy Nests........ 11

Questions on Lesson No. 28........ 64

Selling Direct to Local Dealers........ 31
Selling to Consumer........ 31
Shipping Eggs by Parcel Post........ 38-41
Shipping to Commission Merchants and Jobbers........ 31
Swat the Rooster........ 11

Testing for Evaporation........ 21

Use Pure-Bred Hens........ 5

Valuable Male Birds........ 11

Washed Eggs........ 17
What the Local Dealers Can Do........ 32

PART TWO

HANDLING AND GRADING EGGS FOR MARKET

Appearance of Eggs Before the Candle........ 72-76

Bacteriological and Chemical Results of Composite Samples of Eggs Opened Commercially in the Packing House........ 76

Canadian Requirements for Grading and Marking Eggs........ 89
Candling Room........ 67-71

Determining the Quality of Eggs........ 66-67

Egg Conservation........ 83-84
Egg Packages........ 78
Egg Rules........ 85-88
Exports and Imports........ 66

Formation and Structure of Egg........ 71

Introduction........ 65

Market Grades of Eggs........ 84

Questions on Lesson No. 29........ 94

Railroad Transportation of Eggs........ 80-83
Requirements of Markets........ 65

Safety of Eggs........ 80
Selling of Quality Basis........ 88

The Poultry Industry from the Distributor's Standpoint........ 91

The Market Poultry Business

By T. E. QUISENBERRY

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This branch of the poultry industry has been more or less neglected, and but little attention and study has been given to this subject by our experts and authorities until the last few years.The best methods of disposing of our surplus poultry at a profit, the best plans for fattening, killing, dressing, shipping and marketing, all deserve careful consideration by the poultryman who expects to succeed. Every poultry farmer has surplus males, culls, and hens which have lived to an age beyond the period of their usefulness as layers. How to dispose of these at the best price is a problem.

The Indiana Experiment Station hatched several hundred baby chicks. A record was kept of the value of the eggs, the expense of incubation, the labor and feed in rearing the chicks. The cockerels were marketed at an age when they would bring the best price, and it was found at the end of the season that the price received for the cockerels marketed reduced the expense of rearing the pullets to only 10 cents each. It is true that not many can hope to do so well as that, but if you could rear a flock of chickens and could market your cockerels so that your pullets would cost you even 50 cents each that would still be cheap and you would know the breeding back of your pullets, which would be of considerable help in breeding for egg production. Most of the money that is made in poultry has been in egg production, and we advise against any one entering the business expecting to make money out of an exclusive broiler or market poultry plant. Conditions may be different when we know more about the production, handling, killing, packing, shipping and marketing of either live or dressed poultry.

According to the census report and government statistics, practically fifty per cent of the poultry produced in the United States annually is produced in the Central Western States, including Missouri, Iowa, Kansas, Nebraska, Minnesota, Illinois, Indiana and Ohio. About ninety per cent of all the farms in these states keep poultry of some kind, and they keep an average of a little less than 100 fowls each.

The average price of poultry has increased from 35c to 50c during the past ten years, an increase of nearly 50 per cent. If we can now increase the quality by the use of better methods of production, fattening and marketing, we can expect a still greater in-

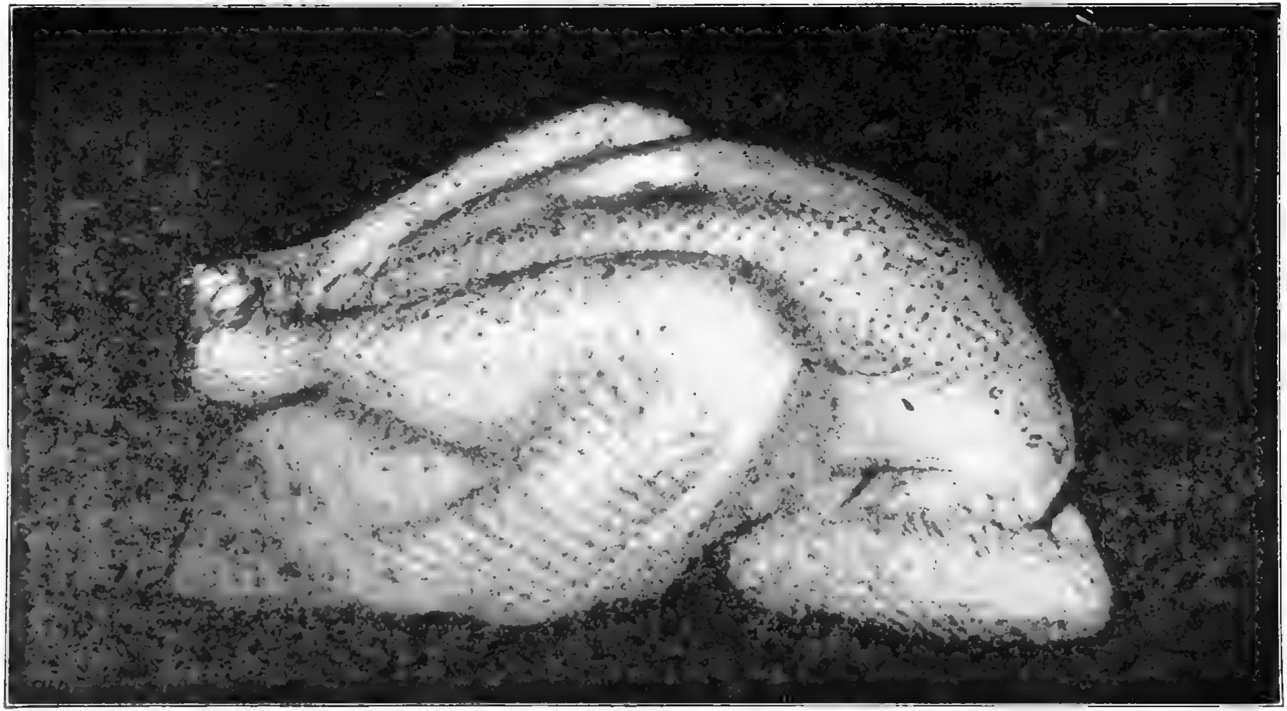

Fig. 1. Ready for the pan. A well fattened and nicely dressed chicken. By improving the quality we can increase the demand and raise the price. This is now the most popular dish in our best hotels and cafes.

crease in price. This means greater net profit. It means a tremendous sum in the pockets of the poultrymen of this country. The increased profit justifies an effort on the part of all poultry raisers to produce and market the best possible product.

Some varieties are better adapted for market purposes than others. The consumer prefers a plump, tender, well meated and well fattened chicken. Some varieties fatten more easily than others and some mature much quicker, and some have less objectionable pin feathers. These points are all worth considering in breeding market poultry. White and Buff varieties seem to be more free from objectionable colored pins than other varieties. There should be uniformity in any kind or age of fowls marketed.

The younger the chickens that are marketed, the higher price per pound they usually bring. As soon as they gain their maturity, or reach the proper age and size, just then they should be marketed, as a rule, and stop feed bills.

Farmers and poultry raisers usually lose hundreds of thousands of dollars in the aggregate because of their methods in marketing surplus poultry. They, too often, hold their cockerels until they are staggy and often receive only half as much for them as they would have received if they had been marketed as broilers or fryers. Then they lose the extra feed and labor which has been given them because they were retained to an age when they became staggy. They also lose much by exchanging chickens for groceries, dry goods, etc The merchant holds them several days, as a rule, and the chickens get out of condition which causes the merchant to lose, and the next time the farmer calls he gets a lower price in order to make up for this loss. By this method of handling poultry the quality and price are both reduced and the farmer or producer suffers for it. The poultryman should keep posted on prices.

THE COST OF PRODUCTION.

As to whether it will pay to rear chickens for market depends upon the skill of the poultryman. If he knows how to handle his stock in such a way as to have small death losses, market chickens will afford a fair profit. Prof. A. G. Phillips, of Purdue, raised 183 birds out of a hatch of 200. The cost of raising each pullet was 39 cents. By substracting the income received from the sale of cockerels on the market the total cost of raising a pullet to maturity was 10 cents. This does not include the cost of hatching. Birds must be hatched early if the cockerels are to be sold at a profit.

Buying birds at reasonable figures and fattening them is a paying business. Prof. Phillips, of Purdue, states that roasting chickens will gain from one to two pounds in two weeks, at a cost of feed varying from eight to 10 cents a pound gain. Ordinary market chickens purchased at 11 cents per pound when milk fed brought 17 to 19 cents per pound dressed weight.

The broiler business is not so specialized as that of producing eggs for market. It is more profitable as a by-product or side line. The risks are much greater than producing eggs and many plants have failed to show profits. One of the main causes for failure

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A big step in preparing fowls for market has been made. The old fashioned way demanded an ax, or the head was wrung off, and after flopping around for a while it was dumped into scalding water and the feathers pulled off. This method will not do when fowls are to be kept long. The biggest loss sustained from dressed poultry is on account of poor bleeding, full crops and poor methods of dressing. The tendency of the methods mentioned is for the blood to clot when exposed to the cold air and all of the blood fails to drain out. Even when the knife is used to sever the veins, unless the proper vessels are thoroughly severed, much of the blood is left in the carcass and when it goes to market and is displayed in the shows the fowl turns red or greenish black. It decays much earlier than if properly bled.

HOW SHALL WE SELL MARKET POULTRY

The farmer can usually dispose of his poultry to local produce houses. This class of buyers usually get the bulk of the poultry in the greatest producing centers, and they in turn ship to the fattening stations and packing houses. Commission merchants also handle a great deal of both live and dressed poultry. If you can ship direct to such a firm they often exert themselves to get all they can for your product, and the better condition in which the poultry is and the better the quality, the higher the price they can usually obtain for the producer. City lot poultry raisers do not have much trouble in disposing of their surplus to nearby neighbors. Suburban poultry farms can often obtain a better price and get greater net returns by selling direct to private trade in the nearest city. The large packing companies fatten, kill, dress, freeze and store in the large cold storage houses of the great cities, and then market as the supply and demand create better prices.

Most poultry raisers, especially on the farm, market their poultry in very poor condition. If you examine the average crate of chickens you will find large and small, lean and fat, sick and deformed. It will pay the average poultryman to use the culls at home, and see that his market coop contains chickens that have been given a little feed and attention before marketing, and that there is some uniformity to them, if he expects the top price. The farmer and poultryman go to all the expense of raising the chicken, and they market the frame and let the fattening stations and the packers make the profit. Most poultrymen do not get enough at the present time for their market poultry to pay the cost of production.

If you can market through a reliable commission firm, this is often a very satisfactory method. We do not like marketing through jobbers, because this makes just one more middle man, one more profit and one more handling before it reaches the consumer. Quite a good many retailers, grocers and markets buy direct from the producer. Such retailers generally reap a harvest in a good trade as soon as the consumer finds this fact out. Most retailers of this class suffer because of not having suitable and adequate equipment, cases, refrigerators, etc., for handling dressed poultry. The Jews consume a large per cent of the live poultry shipped to New York. Most retailers have demands for poultry alive, dressed, drawn and undrawn. Poultry intended for storage should not be drawn.

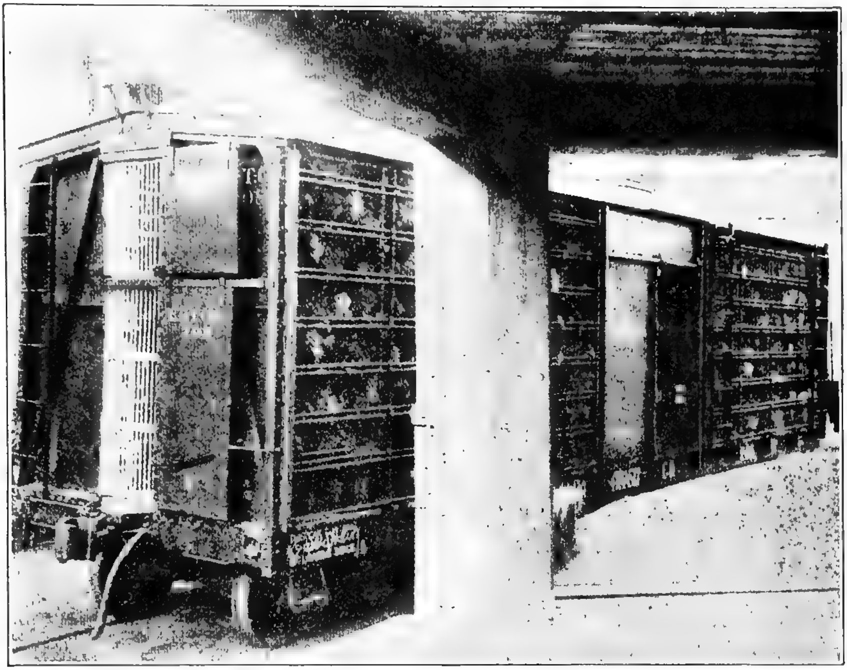


Fig. 3. Shipping live poultry in car lots. Each car holds about 5,000 chickens. An attendant is sent with the car to water and feed the poultry and keep it in condition.

AVERAGE INCOME PER STATE

The average income of each state in the Union from the sale of live and dressed poultry, according to the census report of 1910 was $5,227,403. The poultry sold for meat purposes totaled $1,536,194. If one cent per pound could be added it would mean an increase of $7,512,689 in the revenue from live and dressed poultry.

When it is possible to secure a retail trade it will pay handsomely to fatten poultry for market. You increase the selling value per pound and get a profit on the feed given to make the increase.

It is a difficult matter to secure a trade for fancy live poultry in many of our market centers. Large hotels and restaurants have cold storage space and buy fowls dressed. They have no facilities for dressing live poultry and will not buy them.

It is possible to sell by parcel post and express direct from the farm if the city market is not far away. However, there are only certain seasons of the year that permit this. The private individual with only a limited supply of fowls has quite a problem to face, as it is possible for the farmer of the Far West to dispose of his products to the fattening establishment and they will place them on the market in better shape than the small grower who must depend on shipping in barrels, and packing layers of ice on the fowls. A large per cent of the food value is lost by this method and the liklihood of decay is much greater than when the birds are cooled down without soaking them in ice. The appearance is also much more attractive. A chicken that has ben in cold storage for four or five months is, as a rule, more fit for use than fowls dressed and shipped by the method just mentioned.

The fact that a large percentage of poultry during the summer months go finally to the packing houses to be finished, should encourage growers everywhere to raise pure-bred fowls which present more uniformity in appearance and take on fat much more rapidly than mongrels.

The farmers could increase the price received for their fowls, as the packing houses are anxious to secure high class feeders. Also, when the hens are ready for market, the pure-bred bring better prices than the mongrels.

TOO MANY MIDDLE MEN

In traveling along the customary route from the producer to its final destination, poultry products often make the following stops: Huckster, village store, wholesale buyer, commission merchant, jobber, retail store, consumer. It is a debatable question as to who is the greatest sufferer, the producer or consumer.

The doing away with some of the middle men would increase the price to the producer, insure a better quality to the consumer and give it to him at a reduced price.

The matter of co-operation in the sale of products will work a wonderful change. Only a very small part of the poultry products can be sold direct to the consumer. The large percentage of the poultry and eggs produced in the great farm poultry producing centers must be handled by a middle man, but it is certainly possible to reduce the handling charges.

Co-operative creameries are increasing rapidly. These furnish excellent agencies for handling both dressed poultry and eggs. Often-times the milk from the creamery could be used to fatten the poultry. The wagons that gather the cream could likewise collect poultry and eggs.

BREEDING MARKET FOWLS.

The first essential in breeding fowls for market purposes is to use stock of strong constitution. Good feeders are needed for crate fattening. The indications of a good feeder are a "short, stout, well curved beak, a broad head (not too large), and a bright, clear eye. A bird with a large, narrow beak, a thin, large comb and head, and an eye somewhat sunken in the head, is usually lacking in constitution," and is a poor feeder.

"The neck should be moderately short and stout, indicating vigor. The breast is the most important point in a market chicken.

It should be moderately deep and broad (if broad, it will present a fine appearance and appear well fleshed). It is quite possible that a broad, deep breast will carry more meat than a moderately deep breast of the same width. Yet, there is no doubt that the latter will present much the better appearance and sell more quickly and at a higher price in the market. The breast bone should be well covered with flesh to the very tip.

"The length of the breast should come well forward and not be cut off at an angle. The body in general should present the appearance of an oblong when the head, neck and tail are removed."

There are some types of fowls that cannot be fed enough to have attractive, well formed breasts. The difference in the plumpness of the breasts of birds is a matter of breeding, just as much so as feeding. If you are interested in breeding fowls for fattening purposes, be careful as to the selection of the male birds. Males should be selected with large breast bones that are well covered with flesh. If you expect to breed a meat type, use care in selection.

BEST BREEDS FOR BROILERS

The Wyandottes, Plymouth Rocks, Rhode Island Reds and Orpingtons are all excellent breeds for broiler production. They can be brought to a pound and one-half in six or seven weeks. The White Wyandottes and Plymouth Rocks are perhaps the general favorites. Their shape makes them especially desirable. The White Leghorns for squab broilers are excellent. They can be made to weigh a pound in six weeks. They are yellow legged and their meat is of excellent quality.

The Asiatics are not suited for broiler raising, as they are large boned birds and mature slowly. However, they make good capons.

It is not well to use cross-breeds. The uniformity which is desired cannot be obtained by using cross-breeds. Many poultrymen have the idea that by crossing two breeds, each having a certain characteristic, that the progeny will so inherit both characteristics as to give them just what they want. This is not true, as your lesson on breeding has clearly shown you. The progeny will not have uniformity, which is a great drawback to the dressed poultry business as well as to the egg business.

There are many breeds from which a selection can be made.

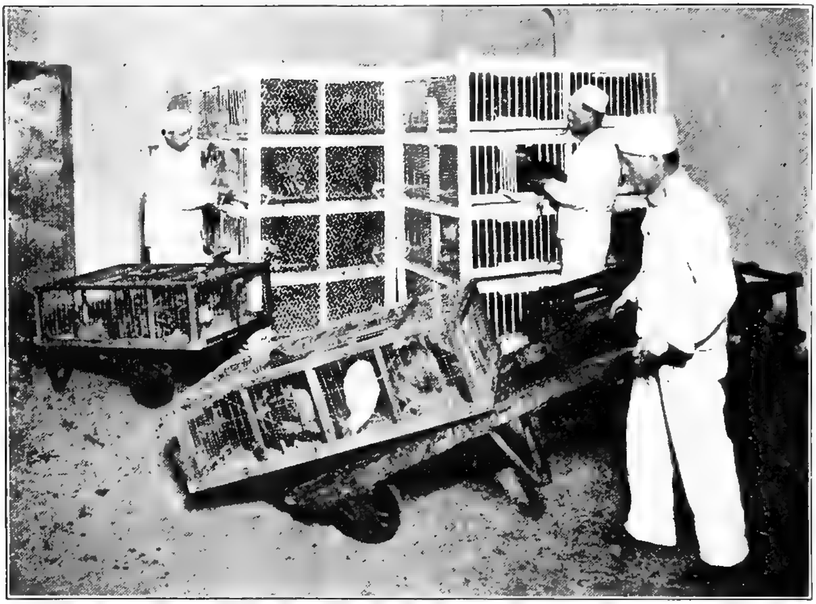
The following table from Pennsylvania Bulletin, No. 87, shows the comparative percentage weight of the different parts of the carcass of the different breeds.

	White Wyan. cocks	White Wyan. pullets	White Leg. cocks	White Leg. pullets	Light Brama cocks	Light Brama pullets	Barred Rock cock'ls	Barred Rock pullets
1. Blood	3.57	3.20	5.40	5.70	5.11	4.43	4.02	4.20
2. Feathers	8.97	6.07	8.64	8.46	9.11	9.38	8.36	7.87
3. Intestines	6.78	6.62	10.13	9.91	11.11	10.16	9.91	8.52
4. Head and Feet	7.78	7.75	7.90	6.30	6.88	6.77	7.43	6.56
5. Bones of Body	7.42	6.29	6.86	6.50	6.66	6.25	7.43	7.87
6. Giblets	4.49	4.64	4.32	4.46	8.00	8.07	7.74	7.54
7. Flesh	60.99	65.45	56.75	58.67	53.13	54.94	55.11	57.38
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

THE WASTE IN A ROASTER—IT AMOUNTS TO FORTY-EIGHT PER CENT

The present course of a shipment of live poultry when received on the market is somewhat as follows, as explained by Loyal E. Payne in a recent statement:

The birds are killed, bled and plucked; the carcasses are cooled and placed on the retail market "dressed." The customer orders a roaster; the cook removes the head, shanks, feet and intestines. The bird is roasted, the flesh or edible portion is consumed and the remainder rejected.



Chickens of different sizes and colors being taken from the shipping crates and sorted into the fattening batteries. They must be handled gently at this time to prevent bruising the flesh or injuring the bird.

The flesh of the roaster, which constitutes an average of fifty-two per cent of the live weight of the bird, is the only portion utilized; the other forty-eight per cent is discarded. It is this forty-eight per cent of wasted material that I wish to emphasize in this article.

The man who killed and plucked the roaster possibly saved some of the feathers and, in certain feeding establishments, a portion of the blood is fed to the poultry, but these savings are not generally practiced. In the home the head, feet, inwards and sometimes giblets—heart, liver and gizzard—are occasionally fed to the dog or cat, but in most cases they are thrown into the garbage can. Neither producer nor consumer gives a thought to the value of such waste. This extravagance is due to a lack of facilities for handling, and the failure to appreciate the value and importance of these products.

tablishments will come. Poultry will be dressed, graded and packed more uniformly; better sanitary methods will be practiced, and the by-products will be of economical importance.

Pending the operation of central killing stations the consumer can create a demand for certain by-products in inquiring for them from producers and dealers. The poultryman, whether large or small, can have a share in promoting this feature of his business by utilizing and advertising useful articles which are now waste material. The continuous supply of these products will create public sanction.

CLASSIFICATION OF MARKET POULTRY AND MARKET DEMANDS

Just as some markets prefer and will pay a premium for white eggs, just so do some markets prefer white skinned chickens and others yellow. European trade demands a white skinned fowl, as a rule, because they have been led to believe that those chickens have been fed and conditioned for the market. Me have been told by some of our American packers that they get the highest prices for their milk fed white skinned chickens. There are exceptions of course.

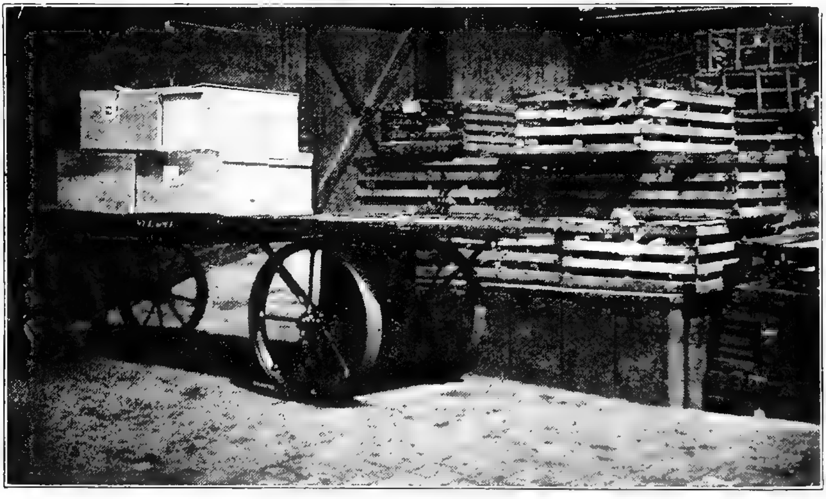


Fig. 4. In shipping poultry in crates like this it is too often roughly handled and bruised. If poultry is allowed to sit out on depot platforms in the hot sun it loses in weight and depreciates in value.

Poultry is classified and divided into different grades accord-to age, size and quality. A young two pound chicken sells at a different price and is used for a different purpose than does a six or eight pound chicken. Therefore, it is necessary to classify them. The classification that is generally used by most buyers and packers, especially in the Middle West, is as follows:

Broilers, two pounds or under.

Springs, over two pounds. They also include roasters from four pounds up, and fryers from two and one-half to three and one-half pounds.

Light hens, three and one-half pounds or under.
Heavy hens, over three and one-half pounds.
Stags, overgrown cockerels.
Capons, castrated males, any age.
Cocks, male birds over one year old.
Hen turkeys, over eight pounds.
Young tom turkeys, over twelve pounds.
Old tom turkeys, over one year old.
Under size turkeys, young and culls.
Ducks, young or old.
Geese, young or old.
Guinea fowl, usual run.
Pigeons, by the dozen, or pound in some markets.
Squabs, by the pair, dozen, or pound.

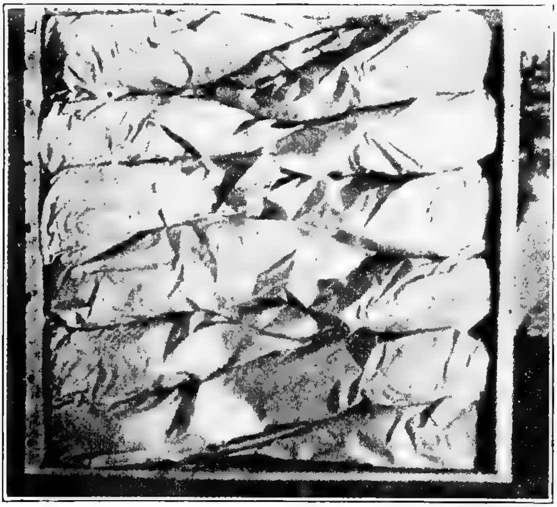


Fig. 5. Broilers wrapped and packed single layer.

Broilers are young chickens intended for broiling. Squab broilers are the smallest in size, weighing from three-fourths to one pound. The broiler class is divided into four classes: Squab broilers, light, medium, and heavy broilers. Squab broilers are served whole as one portion. Those weighing one and one-half pounds and over are usually served in halves, one-half to each person. The heavy broilers weigh about two and one-half pounds and are used for fryers. The exclusive broiler business has been on a fast decline for the past ten years, and today broilers are chiefly a by-product of poultry farms. We do not recommend that any one erect and equip a plant exclusively for broiler raising.

Springs weigh from two pounds up. These are usually graded by testing the hardness of the rear part or end of the keel bone.

If the end of the bone is hardened the bird is classed as a hen or stag. If the bone is soft and the chicken is of this weight, it goes into the spring class. Springs also include the roaster class, which runs from three pounds up.

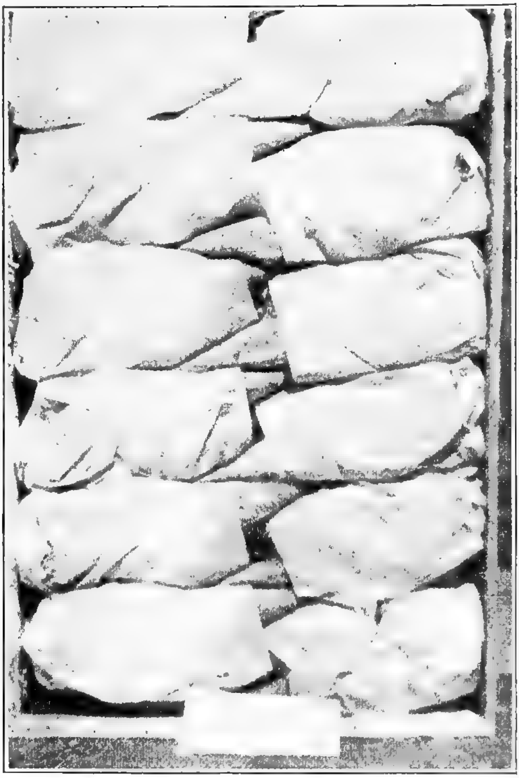


Fig. 6. High grade "springs" packed single layer.

Hens. These are divided into two classes, light and heavy. The heavy hens usually sell for two to three cents per pound more than the light grade. The light hens include most of those in the Leghorn class and the smaller varieties.

Stags are the overgrown males. They weigh from four to eight pounds, as a rule. Spurs usually show considerable development. The end of the keel bone has become hardened when they reach this stage and all such are put in this class.

Capons are castrated male chickens and show very little of the male characteristics. Their hackle and saddle feathers are long and silky. They have no comb or wattle development and they are lacking in the bright red color. Their heads are small. They are fatter and plumper than the ordinary rooster.

Cocks are the males over one year old. Their spurs are firmly grown from their legs and are longer than in the case of stags. The appearance of the head is also some indication of the age.

Hen turkeys must weigh over eight pounds. Their feathers are rather dull in color compared to the male and the wart-like growths on the head are less prominent.

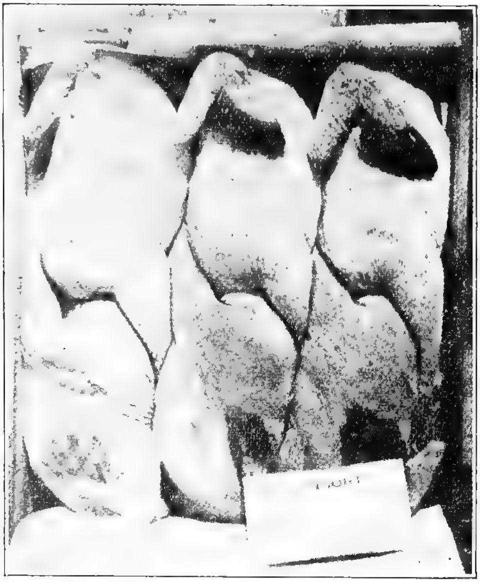


Fig. 7. Hens packed double layer.

Young toms must weigh over twelve pounds. Their heads are redder than the females. The end of the keel bone is soft and less rigid than in the older birds.

Old Toms weigh fifteen pounds and over. They are heavier and coarser looking and have spurs.

Under size turkeys are the small ones and those classed as culls. This grade includes those which are young and immature.

Ducks include both young and old. In some sections the young ducks are classed as ducklings. The young are distinguished from the old by the softness or hardness of the windpipe, the trachea of the young duck being soft and pliable.

Geese. No distinction is usually made between young or old. The greatest demand for them is during the holiday ,and many of the packing houses do not want geese during the summer months.

Guinea Fowl is taking the place of wild game to some extent. On the market no difference is made between the male and female. The male has a redder color in the face and wattles. The wattles of the male stand out farther and the cry is louder and more prolonged.

Pigeons are divided into two classes, squabs and pigeons. The squabs are marketed when about four weeks old. They are served whole as one portion.

Broilers should be a by-product, as a rule, chiefly the surplus cockerels and culls from the farm. If you are located near an unusually good market it might pay to specialize in broilers, otherwise it is dangerous to do so. Broilers should have short legs, and small combs and wattles. They should be hatched from a strain that develops rapidly and feathers early in life. The quick growth makes the flesh tender, lessens the expense of labor and feed, and enables

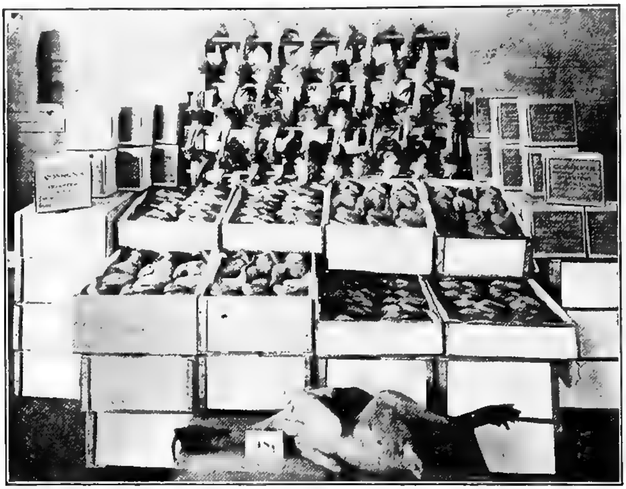


Fig. 8. Poultry of all classes and grades well fattened, nicely dressed and neatly packed. A turkey in front of the packages.

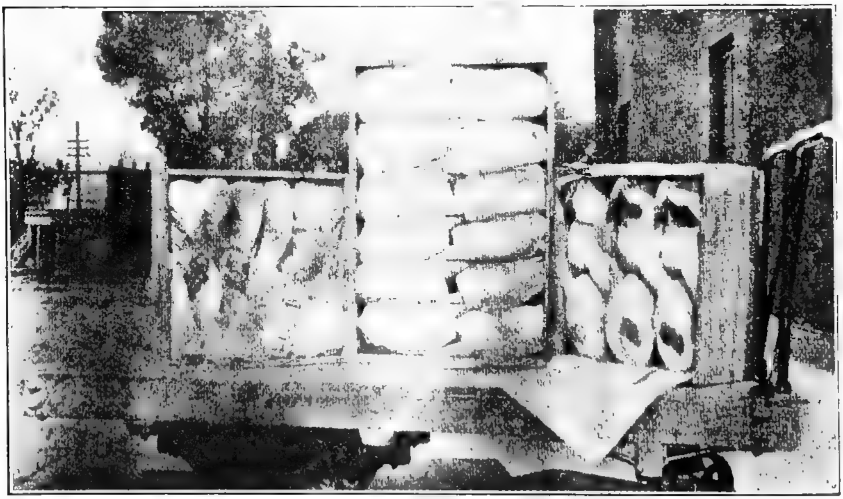


Fig. 9. From left to right: Broilers packed breast up, wrapped. Chickens side packed, single layer, wrapped. Fowl, double layer, side packed, feathers on wing tips used as mark for fowl.

the poultryman to turn his money more rapidly. Birds with light colored feathers usually dress up nicer because the pin feathers are less visible. The breast and thighs should be full and plump.

The season when best prices are paid for broilers is during the winter months. This necessitates the purchasing of a com plete and expensive hatching and brooding equipment. The feeding should be similar to that recommended for growing chicks, except that they should possibly be fed more feely to promote the most rapid growth possible and tender, juicy, soft flesh. As soon as they reach marketable age they should be marketed if the price is right.

Fryers are larger and older chickens than broilers, and weigh from two and one-half to three and one-half pounds. They are handled in much the same way as broilers. They are usually not forced so rapidly at the beginning and special attention is paid to milk feeding and special methods of fattening them just before being marketed. This class of chickens includes most of the farm grown young stock from the Middle Western States. These chickens have lots of free range and are not marketed until after their natural feeding season and when chickens are held longer than when special attention is given to broiler raising.

Roaster growing is not engaged in very extensively. In some sections breeders make a specialty of growing birds which are tender meated, of large size and fine quality and in good condition for roasting. The small roasters are in greatest demand; they weigh from four to six pounds. The large roasters weigh from six to twelve pounds. A roaster may be a bird of either sex. It is necessary to give special attention to marketing and to growing and fattening roasters if one is to succeed in this brach of the business. It is engaged in more as a side line than as a business.

POULTRY GRADES

The National Poultry, Butter and Egg Association have established grades for dressed poultry as shown below. While some packers have refused to recognize these rules, yet the majority are using this as a basis from which to work. It might be well for you to acquaint yourself with these grades.

DRESSED POULTRY

Quality—Poultry shall be graded into grades, No. 1 and No. 2.

No. 1 Chickens and Broilers shall be good, meaty birds, free from No. 2's and stags; well dressed; heads wrapped; feet clean.

No. 2 Chickens and Broilers shall be birds not good enough for No. 1's, such as hump-backed, defective dressing, torn(and thin in flesh; but contains no culls.

No. 1 Fowl shall be good, meaty birds; well dressed, heads wrapped; feet clean.

No. 2 Fowl may be pin-feathery, poorly dressed, skin broken, or defective dressing, and torn, but free from culls.

No. 1 Ducks to be all birds of good flesh; well dressed; feet clean.

No. 2 Ducks, birds not good enough for No. 1's, such as deformed, defective dressing, and torn, but free from culls.

Geese—Same as Ducks.

No. 1 Turkeys, to be all good flesh; not bruised; feet clean.

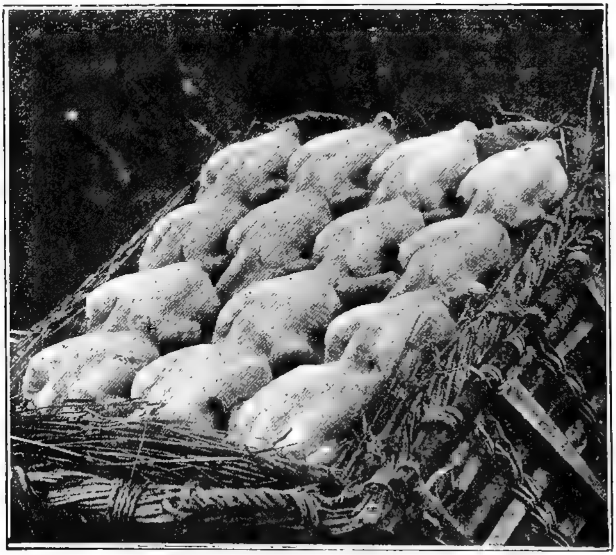
No. 2 Turkeys, birds not good enough for No. 1's, such as crooked breasts and defective dressing; or birds whose wings or legs have been broken or bruised while being dressed.

All birds to be free from feed; no birds in the No. 2's that show evidence or having been diseased when killed.

Weights—Broilers, Squab, birds weighing 1¼ lbs. and less; no boxes to weigh more than 15 lbs. Small birds, weighing over 1¼ lbs. to 1¾ lbs.; no boxes to weigh more than 20 lbs. Medium birds, weighing over 1¾ lbs. to 2⅛ lbs.; no boxes to weigh more than 20½ lbs. Large birds, weighing over 2⅛ lbs. to 2⅝ lbs.; no boxes to weigh more than 30 lbs.

No. 2 Broilers, small, birds weighing 1¾ lbs. and less. No. 2 Broilers, large birds weighing 1¾ lbs. to 2⅝ lbs. Broilers to be wrapped; packed breast up; one layer boxes unless otherwise specified; boxes lined with parchment paper; heads wrapped; feet clean.

Chickens, Small Fryers weighing over 2⅝ lbs. to 3⅛ lbs.; no box weighing over 36 lbs. Large fryers, weighing over 3⅛ lbs. to 3⅝ lbs.; no boxes weighing over 42 lbs. Small Roasters weighing over 3⅝ lbs. to 3⅞ lbs.; no box weighing over 47 lbs. Medium Roasters weighing over 3⅞ lbs. to 5 lbs.; no box weighing over 55 lbs. Large Roasters weighing over 5 lbs. to 6 lbs. **Extra Large Roasters, 6 lbs. and over.**



No. 2 Chickens, small, weighing over 2⅝ lbs. to 3⅝ lbs. No. 2 Chickens, large, weighing over 3⅝ lbs.

Stags, small, weighing 3⅞ lbs. and under. Stags, large, weighing over 3⅞ lbs.

No. 1 Fowl, small, birds weighing 3 lbs. and under. No. 1 Fowl, medium, birds weighing 3 lbs. to 4 lbs. No. 1 Fowl, large, birds weighing 4 lbs. to 5 lbs. No. 1 Fowl, extra large, birds weighing 5 lbs. and over.

No. 2 Fowl, small birds weighing 4 lbs. and less. No. 2 Fowl, large, birds weighing 4 lbs. and over.

No. 1 Ducks, small birds weighing 3½ lbs. and under. No. 1 Ducks, medium, birds weighing 3½ lbs. to 4½ lbs. No. 1 Ducks, large, birds weighing 4½ lbs. and over.

No. 2 Ducks, all sizes.

No. 1 Turkeys, Young toms, any size. **No. 1 Turkeys,** Hens, all sizes, but natural proportions of old and young mixed.

No. 1 Geese, small birds, weighing 8 lbs. and under. No. 1 Geese, medium, bird weighing 8 to 11 lbs. No. 1 Geese, large, birds weighing 11 lbs. and over.

Packing—All poultry packed 12 birds to the box; all boxes to be lined with parchment paper unless otherwise specified.

THE CHANNELS OF TRADE FOR POULTRY AND EGGS

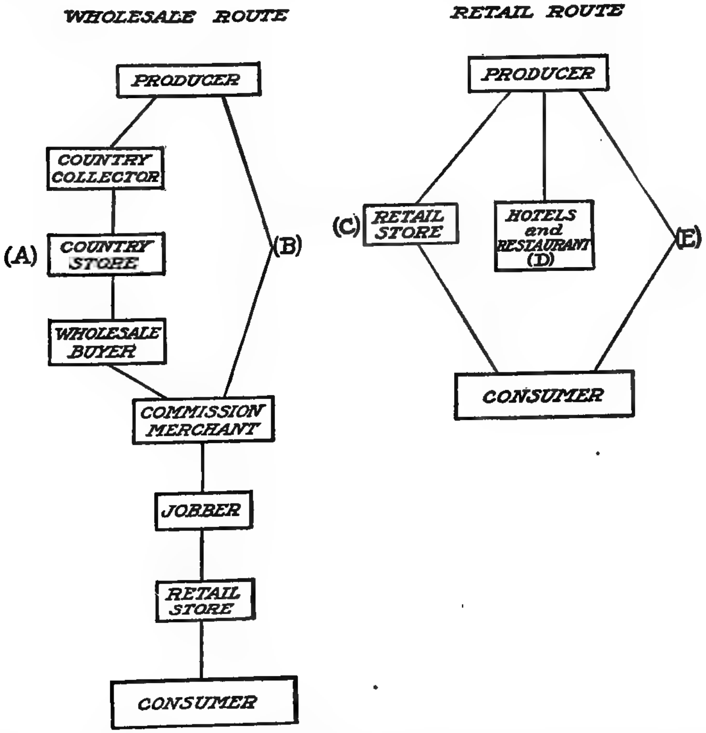


Fig. 9A. Chart showing the courses through which eggs may pass in going from the producer to the consumer. A, the course taken by the great bulk of the "western" product in reaching the eastern markets; B, the course taken by the eastern output in reaching New York and other large centers of distribution; C, direct selling through the retail store; D, the hotel and restaurant trade; E, products going direct from producer to consumer.

Packages—Packages shall be new, uniform, and of sufficient strength to carry the product in good condition.

Marking—It shall not be necessary to mark anything except the net weight of the poultry on the packages; it will be understood that every package contains 12 birds, unless marked otherwise.

Testing Weights—All weights shall be tested by taking the contents of five packages, weighing them at one time, and adjustment shall be made between the net weight of the five packages weighed at one time, unless, otherwise agreed upon, and the marked weights. Seller must specify the state in which poultry is packed.

All No. 1 poultry shall be dry and sweet.

No. 2 poultry may be slightly damp, but must be in a good, merchantable condition.

From Producer to Consumer—It is interesting to note the many channels of trade and the great number of hands through which every shipment may and usually does pass before it reaches the consumer. Figure 193 is a diagram portraying the different courses which poultry products may take. The above illustration and remarks were taken from "Productive Poultry Husbandry," written by Prof. H. R. Lewis and published by Lippincott Co.

QUESTIONS TO LESSON NO. 30 MARKET POULTRY BUSINESS

1. Should the production of market poultry be the chief occupation on a successful poultry farm? What place should market poultry have on such a farm?

2. What consideration should we give to the selection of a variety in producing market poultry? What points should be considered?

3. What common mistake do most farmers make in holding and marketing their surplus cockerels?

4. Why is it best to have large fattening and packing plants in the poultry producing and corn growing states, and not attempt to ship all poultry alive?

5. What is the source of the greatest loss from dressed poultry? And describe the kinds or classes of poultry usually found in market poultry coop.

6. Will it pay the average poultry raiser to cull and fatten his poultry? Why?

7. What varieties do you consider best for broiler production?

8. Why is it necessary to have classes and grades for poultry?

9. Name the different classes of market chickens and tell briefly what constitutes each class.

10. What is meant by a squab broiler?

FATTENING AND CONDITIONING FOR THE MARKET

At a recent convention of hotel stewards assembled from all parts of America, a vote was taken as to the most popular dish, The result of the vote showed that chicken easily leads the culinary list of the nation. Not only is chicken now the most popular dish, but it can grow much more so if those who produce and prepare chickens for the market will see that they are properly conditioned before they are dressed or offered for sale. We can increase the demand for market poultry and we can increase the price, if we will decrease the amount of thin, blue breasted, poorly dressed chickens which are offered for sale.

There are some questions as to just how far the farmers or producers can go with profit in an attempt to fatten poultry. It requires an expert or someone well acquainted with the methods of fattening to so feed a chicken that the fat globules will be properly distributed through the flesh. (While this is true, we are of the opinion that the average farmer and producer market their poultry before they have made any attempt to fatten it, which attempt they should and could make with profit. Too many farmers go to all the expense of raising a chicken, that is, they produce the frame, then sell it to the fattening station and the packing houses and leave them to make all the profit.

The heavier breeds, like Plymouth Rocks, Wyandottes, Reds or Orpingtons are more easily fattened than the smaller breeds, for the reason that the smaller varieties are more nervous and do not put on fat so rapidly. The type of chicken which most feeders prefer is described as a "quiet, medium, short bodied, fine boned, short legged, broad backed, bright eyed individual."

Some fattening establishments make a practice of feeding three times a day; others get about as good results by feeding only twice. The feed used also varies with the different feeders and establishments. The best feeding season is during the fall months. Poultry is cheaper then, and besides chickens do better and put on fat more rapidly then than they do in the hot weather of summer or the cold weather of winter.

The feed mixtures used and recommended below will be found to be very good.

Winter Months:
60 lbs. corn meal.
25 lbs. low grade flour.
5 lbs. wheat bran.
10 lbs. ground oats.
6 gallons condensed butter-milk.
10 gallons water.

Summer and Fall Months:
20 lbs. ground oats.
50 lbs. corn meal.
20 lbs. wheat bran.
10 lbs. low grade flour.

8 gallons condensed buttermilk.
10 gallons water.

The ground feeds are thoroughly mixed, then mixed with the butter-milk and water. The mixture is heated before being fed in the troughs which extend along the front of the feeding batteries. Mix in just enough of the water and butter-milk solution to make the feed a sloppy batter about the same consistency as pan-cake batter.

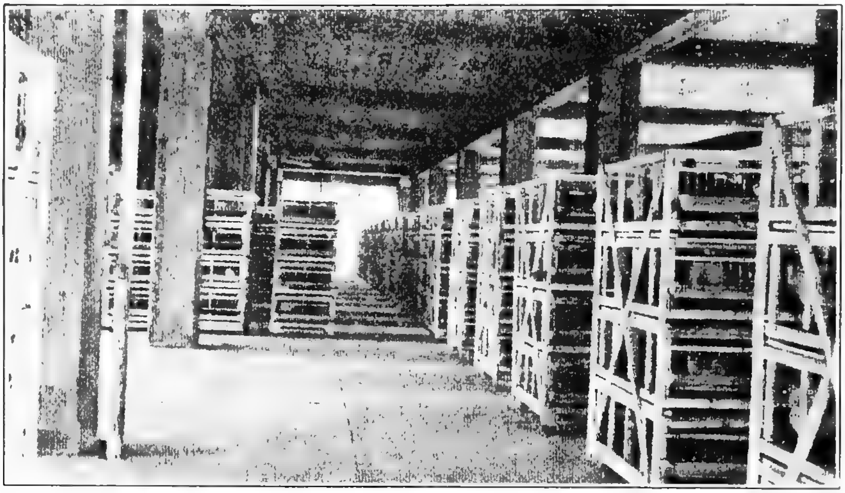


Fig. 10. A glance down the alley of a fattening battery on one of the feeding floors of a feeding establishment.

The object of fattening is not only to increase the weight of the bird and place the fat on the body, but it is done to increase the flavor of the meat by distributing the globules of fat throughout the tissues. By putting them in fattening crates, exercise is stopped and their muscles softened. This is one of the chief advantages of crate fattening. The pen method is some cheaper as far as equipment is concerned, but the fowls do not have the same flavor and are not so tender as those fattened by the crate method.

When the crate method is used the crates should be located in some place that is very quiet, where the birds will not be disturbed. If only a few birds are to be fattened a home-made fattening crate can be used. When fattening is done in a large way portable batteries should be bought. They hold a large number of birds and are convenient to handle. They can be moved from place to place. If the building has several floors and fattening is done on the top floor and the killing in the basement, the batteries can be filled with chickens and placed on the elevator and carried down to the killing room. They are easily cleaned, and they should always be cleaned before they are carried back to the floor where the chickens are placed in them.

The pen method is not so efficient as the crate method, but in corn feeding roasters this method can be used. There is danger of the pens becoming very foul, as it is difficult to clean them. Many of the weaker bids fail to get their share as they are crowded out and tramped on by the stronger birds. Moreover, the birds get too much exercise in pens and cannot have the quietude of the crates.

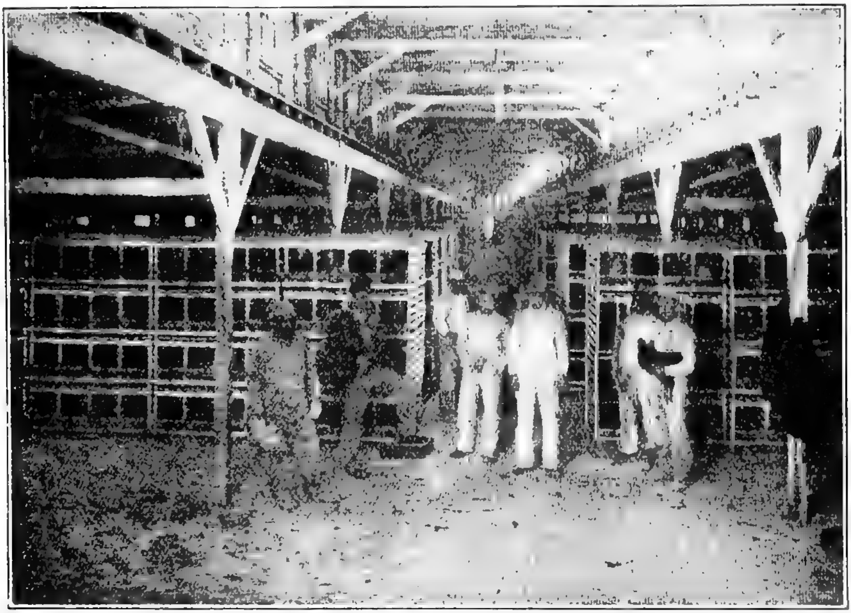


Fig. 11. Sixty-five thousand chickens being fed at one time in this fattening station.

The crates hold from six to twelve birds, depending upon size and age. The crates should have slatted fronts so that the birds can get their heads through to eat from the trough which is placed in front. It is better that this trough be made of tin, which makes it easier to clean.

The third method is by cramming, which is used largely in the old countries, but is not much in vogue in the United States for the difference in price paid for birds that have been crammed is not sufficient to justify the extra trouble. This work is much more expensive and requires more skill than the other methods mentioned, as there is danger of injuring the birds, since many of them cannot stand the strain to which they are subjected.

The machines in use have either a rubber or a metal tube which is inserted into the birds' throats and their crops filled with food. This will force them to take more food than if left to their own discretion. This nutritive ratio of a fattening ration should be about 1:8 or 1:9. The birds should be well dusted with lice powder before being placed in the coops. They will not fatten well if they are infested with insects. There are certain types also that will not fatten well and it will take some practice to select good feeders. Some birds that are low in vitality and out of condition will not take on fat and if kept in the crates long will lose in flesh rather than gain.

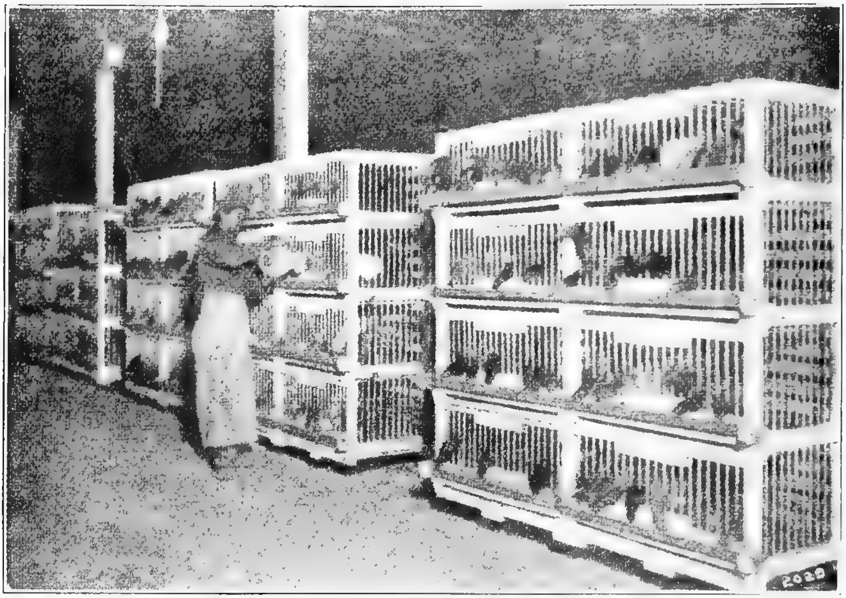


Fig. 12. Shows the feed man filling the feed troughs with a feed made about the consistency of batter.

In the work of fattening poultry for market, done by the Bureau of Animal Industry, a ration made of equal parts by weight of corn meal and low grade wheat flour was fed from the commencement of the season, July 23rd, until August 11th, when shorts were added, making equal parts of corn meal, flour and shorts, up to September 7th, when the ration was changed to three parts corn meal and two parts flour. These rations were mixed with condensed buttermilk diluted with one part of water, which made a thick feed. Later in the season good results were obtained by feeding a ration of three parts of corn meal and two parts of low grade flour, without any shorts. In this experiment it was found that the cost of producing flesh was greater with broilers than with roasters.

In these experiments, which were conducted on a very large scale, an especially prepared mixed feed was tried out which cost $2.70 per hundred. The feed of shorts, bran and corn meal cost only $1.60 per hundred.

One experiment was tried out with a ration that contained one part shorts, two parts of low grade flour, and 2.5 parts of corn meal. These were check lots on several pens that had the same ration with six per cent of tallow added.

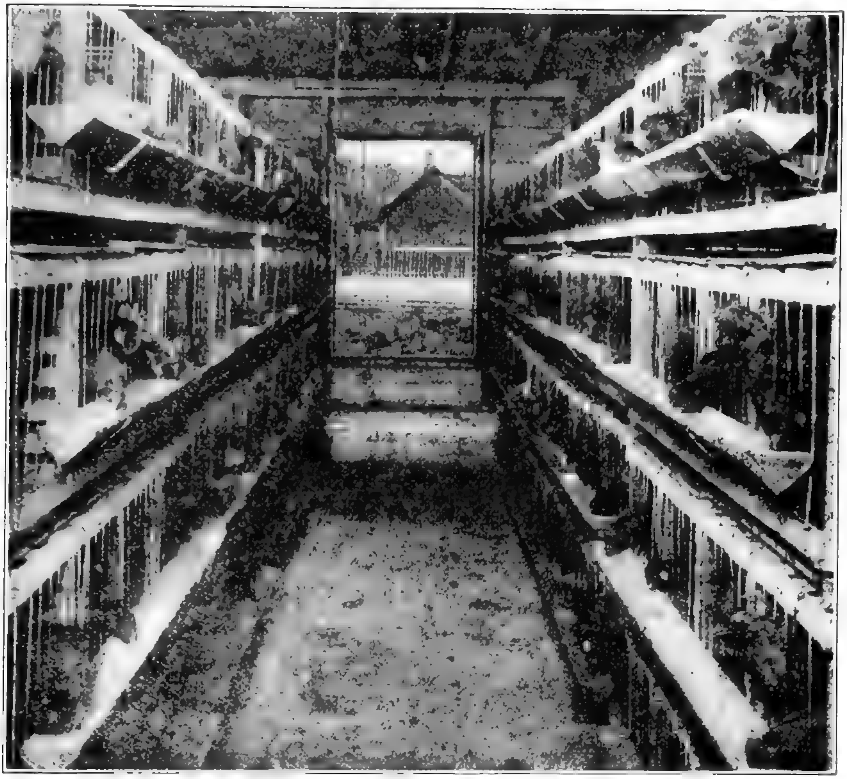


Fig. 13. Shows the heads of the chickens through the slatted fronts of the feeding crates as they eat the fattening food. After two weeks feeding they are killed and sold as milk fed chickens.

The tallow increased the cost of the gains, but did not increase the gains in porportion to the cost. The tallow does increase the gains to some extent and makes the fat appear more distinctly on the birds. The conclusion was that on the whole the increase of the tallow to the ration did not appear to be of any advantage.

One lot received equal parts of oat flour, low grade wheat flour and corn meal. This proved to be a very efficient ration and produced gains with slightly less feed but at a higher cost because of the difference between the price of oats and low grade wheat flour and corn meal. The conclusion was that oats are a good fattening feed but are more expense.

Another lot was tried out with two pounds of finely ground beef scrap per 100 head. The beef scrap did not seem to affect the gain of the cost of gain. Fresh meat was added to the beef ration with very good results.

It was found that chickens will use more corn meal efficiently during the cool weather than they will during the hot weather. The cost of gains in cold weather is very high.

In some of the experiments the 17-day lots showed the cheapest gains and the cost of the gains increased as the length of the feeding period decreased. A comparison of the results at the various feeding stations shows that the common practice of feeding broilers and springs for about fourteen days during the first part of the feeding season and separating the roasters and broilers about the middle of September, while gradually reducing the feeding period of the roasters, is the most profitable practice unless there is a special reason for feeding longer in the fall. It seemed that by feeding twice instead of three times daily the grain was used more efficiently in producing gains. Under average conditions the birds will eat more feed if fed three times a day, but the cost of the gains will be more.

Salt was fed at the rate of four pounds of salt to every 10,000 birds without producing any results. The feeders seemed to think that the salt kept them from picking each other. If this is true, then it pays to use some salt, but there seems to be no effect on gains.

Grit was fed at one feeding station and omitted at two other stations. When birds are not kept in the pens more han 16 days they do not need grit, as it increases the labor and the cost and does not seem to have any effect.

FATTENING WITH WHOLE GRAIN

Probably 28 per cent of the poultry raisers use shelled corn as a standard feed for growing the young stock, feeding for eggs and fattening the chickens; but many people who use it for that purpose would be indignant if told that they should fatten their birds before selling them. They would immediately reply that they do fatten them on shelled corn several weeks before they are sold.

In order to determine how well chickens could be fattened on whole grain, Prof. Mitchell fed a number of pens of birds on different rations at the Pennsylvania Experiment Station during the fall of 1911. The results were as follows:

That birds confined in small pens and fed shelled corn for three weeks made gains of less than one-fifth of a pound each.

That birds fed shelled corn and meat scrap for the same length of time made slightly better gains.

That birds fed shelled corn and wheat did not make as good gains as the lot fed shelled corn alone.

That birds fed shelled corn, wheat and meat scrap did not make as good gain as those fed shelled corn and meat scrap.

That birds fed corn meal and meat scrap moistened with water made a gain of two-fifths of a pound each.

That birds fed on corn meal mixed with butter-milk made a gain of one-half of a pound each.

That when birds were confined in a fattening crate and fed a ration of finely ground grain moistened with butter-milk, each bird made a gain of one pound; and this gain was made at a cost of about seven cents for each pound gained; while the cost of the gains on the birds fed on whole grains ranged from thirty to sixty cents for each pound gained.

The birds used in these tests were of similar breeding, and the pens did not vary in weight more than one pound at the beginning of the test. One pen had the advantage over the other. The birds fed whole grain were fed in small pens and had all the water they wanted to drink, and all the grit and green feed they wanted. The birds fed in the crate did not have grit or green feed or any water during the test, as these things are unnecessary when birds are crate fed.

These results proved that whole grain does not fatten chickens; that it is cheaper to feed the grain finely ground, and that the best gains can be had by feeding birds finely ground feeds when confined in crates.

FATTENING HENS

The results of feeding over 20,000 hens in feeding experiments conducted by the Bureau of Animal Industry proved that a pound of gain was not very profitable, and that this work does not pay unless the hens are to be fed with milk, with a view of selling them as milk fed hens. The average cost per pound gain was 7.7 cents in one experiment and 10.3 cents in another. Sometimes, however, hens are placed on the market that are so thin in flesh that they are not very salable. In such cases it will often pay to put them in good flesh, for they can be sold then at a much higher price per pound than they would sell for if they had not been fattened. It costs much more to feed hens during the months of November and December. The cost ran as high as 10.43 cents per pound during these months. Corn chop and butter-milk were fed to hens for live shipment during the summer months, but in very hot weather the birds did better on a ration of corn chop, with eight per cent of low grade flour and five per cent shorts,, which was found to be less heating than the chop alone.

Butter-milk has a decided influence on molting. The forced feeding of fattening rations renews the feathers very rapidly. This fact was clearly brought out by the experiment conducted by Mr. Alfred Lee, of the Bureau of Animal Industry. He states that this fact should be noted in connection with the feeding of laying hens during the late summer to promote rapid molting and the growth of new feathers without forcing the birds. Butter-milk bleaches the fowls. An addition of condensed milk to the butter-milk showed marked results in producinb a bleach in the poultry. The acid in the butter-milk helps keep the bird in good condition and it has a greater feeding value than water for moistening the mash.

It was found in these feeding tests that ground peanuts were very laxative in effect and though they ate the ration well, yet they grew thin. A ration of six per cent of peanut meal gave good results. The peanut flavored the flesh and produced a peanut fed chicked which sold at a fancy price, but the meal cannot be fed in quantities.

The following are some of the conclusions of the experiments conducted by Mr. Alfred Lee, of the Bureau of Animal Industry:

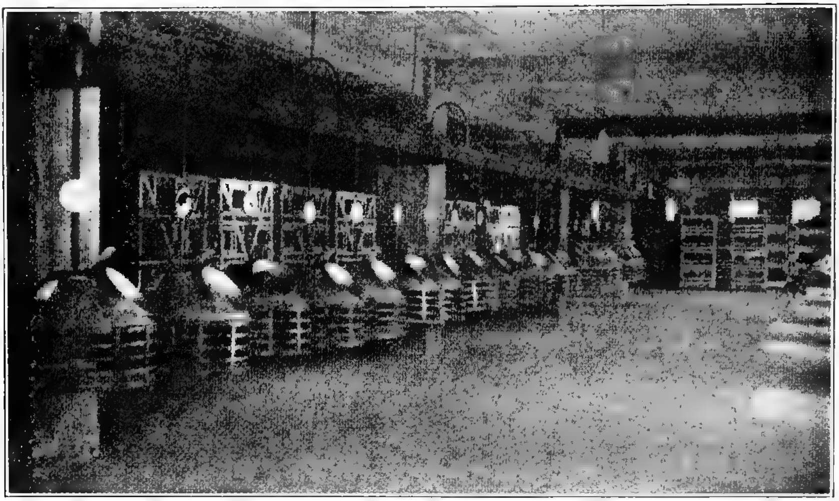


Fig. 14. Every possible device that is time saving and efficient is employed in handling poultry in the large establishment. A scene in the receiving room of the Seymour Packing Company, of Topeka, Kansas. Into three cages is graded the poultry as it is received. Each cage will hold from eighteen to twenty-four head. The cages are on a track into which has been inserted a scale, thus making the weighing simpler and more accurate.

The average cost and the amount of feed consumed in fattening 394,744 chickens at the four feeding experiments during one season were, respectively, as follows: Grains per pound of gain, 3.62, 3.33, 4.45 and 4.18 pounds; cost of feed per pound of gain, 7.83, 7.20, 7.15 and 8.71 cents; total cost per pound of gain, 9.18, 9.20, 8.96 and 10.27 cents. The average for the following year for 498,681 chickens were: Grains per pound of gain, 4.42, 3.58, 3.72, and 4.98 pounds; cost of feed per pound of gain, 8.74, 7.70, 6.61, and 9.95 cents; total cost per pound of gain, 10.37, 9.69, 7.98, and 11.54 cents.

Tallow, while making the fat on the birds more pronounced increased the cost of gains. Thick condensed butter-milk in place of tallow produced better results.

Under commercial conditions in the Middle West the best results are secured by fattening for about 14 days until the middle of September, and then gradually shortening the period.

Mechanical labor-saving devices reduced the cost of fattening by reducing both the total amount of labor and the proportion of skilled labor required. The portable feeding battery turned out the birds in better condition and reduced the cost of labor per pound of gain.

Gains were produced at 1.89 cents and 1.44 cents, respectively, per pound cheaper one year, and 6.30 cents and 2.68 cents less the following year on broilers than on roasters, in two experiments.

There was great variation in the results secured in fattening. This was due to the difference in the ability of the birds to take on flesh to their weight, and to the effect of weather conditions. The variation in birds makes their selection in fattening of considerable importance, if the labor of the extra work can be handled economically. The influence of the weather in fattening allows a chance of error in comparing fattening experiments conducted at different times.

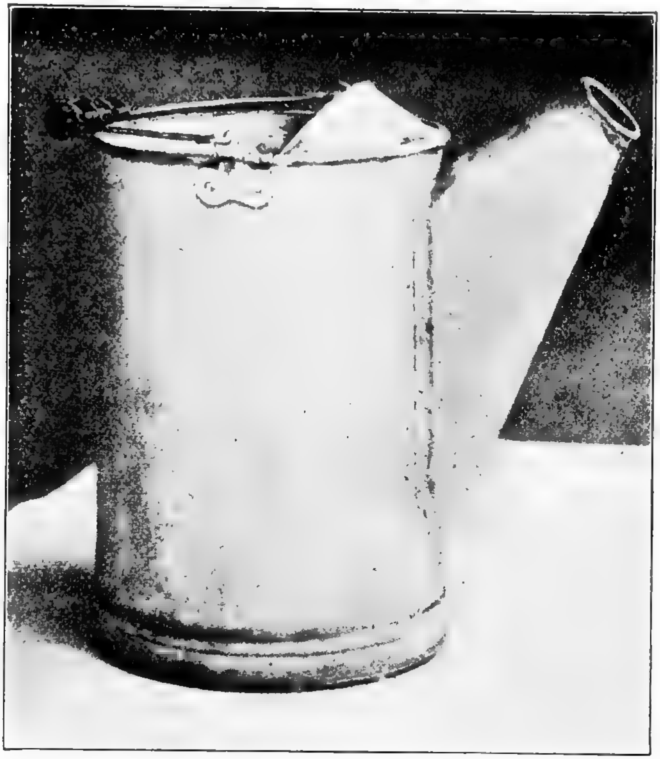


Fig. 15. A bucket which is used to pour the feed into the troughs.

The average cost of fattening hens in November and December was 10.92 cents and 8.74 cents; and 10.83 cents and 10.43 cents, respectively, per pound of gain at two stations. This is higher than the average cost of fattening chickens for the entire season at the same stations, but less than the cost of fattening chickens in November and December. Hens cost 7.7 cents per pound to 10.3 cents into the feeder, so that their flesh can be bought cheaper than they can be produced at this time of the year. Prices on all kinds of poultry are much higher at present than in former years or than those given here, but the relation of facts and prices are the same. Cheaper gains were secured in fattening hens on the rations used in fattening chickens than on a ration of corn chop with 15 per cent of shorts, mixed with butter-milk.

Chickens cost 17.6 cents per pound into the feeder in July, while the gains cost seven cents per pound at this time; in November they cost nine cents per pound into the feeder, and the gains cost 10.5 cents per pound. This influences the profit in fattening and the best length of time to fatten, making it advisable to feed longer in the first part of the season. The cost of picking, grading, and packing (including freezing), was about seven cents per head, making the total average cost of a pound of dressed poultry in July, 20.5 cents, which gradually decreased through the season to 13.1 cents in November.

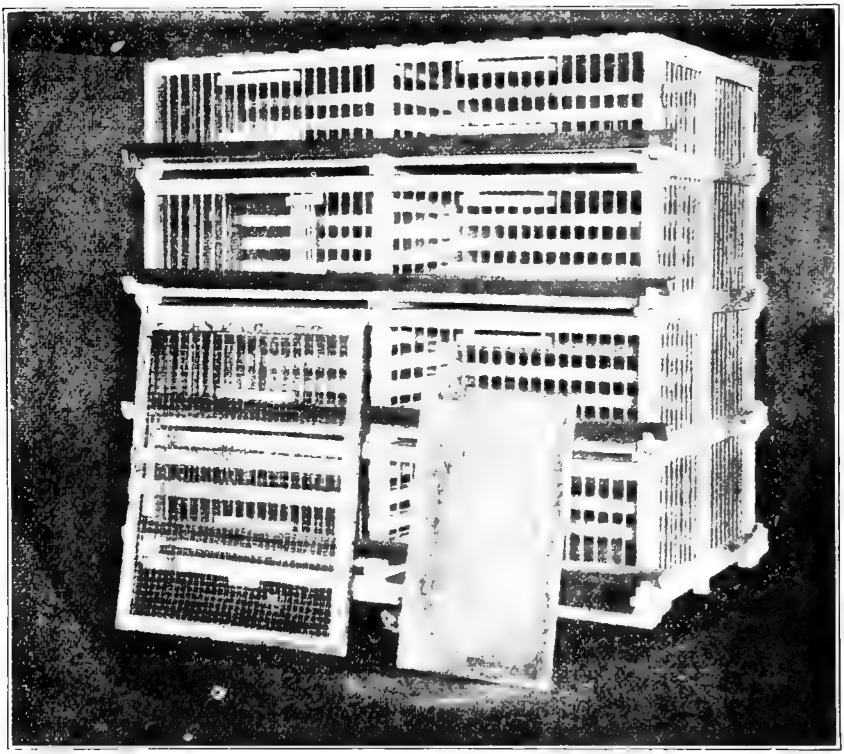


Fig. 16. Fattening crates. Notice that it is portable. Has rollers under it is it can be moved about with ease. The droppings pan is removable so it can be cleaned. Also the wire bottom on which the chickens stand is removable. The crates should be thoroughly cleaned each time before a fresh lot of chickens are put into it.

The best results were secured with the following three rations: No. 1, 3 parts of corn meal, 2 parts of low grade wheat flour, and 1 part of shorts; No. 2, 3 parts of corn meal and 2 parts of low grade wheat flour; and No. 3, 5 parts of corn meal, 3 parts of low grade wheat flour, 1 part of shorts, and 5 per cent of tallow. The same feeding value is secured in a ration of 3 parts of corn meal and 2 parts of oat flour, but at an increased cost of 37 cents per 100 pounds of gain. Four parts of corn meal, 2 of low grade wheat flour, and

1 of shorts gave very good results during the latter part of the feeding season, or in cool weather; that is, the proportion of corn meal and low grade wheat flour may be increased in cool weather.

REMOVING BIRDS WHEN "OFF FEED"

Great care must be exercised in keeping poor feeders out of the crates. Birds of weakened vitality will not stand up under heavy feeding and when any are found out of condition they should be removed from the crates. There is danger of spreading disease through the flock. The fact though that the batteries are separated lessens this danger.

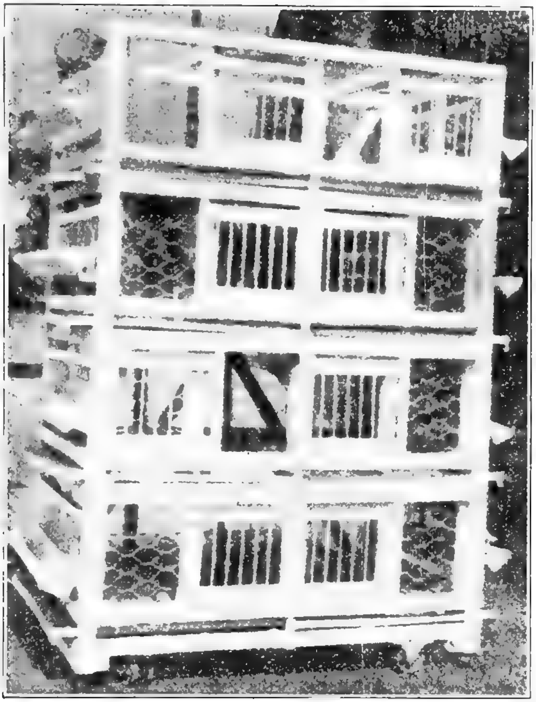


Fig. 17. A fattening crate which is simply a frame covered with poultry netting. There are many styles of fattening crates.

FEATHER PICKING

Most of the chickens that are bought for fattening come from farms where they have been poorly fed. They are bought by the country merchant to be shipped to the packing house. They often start to picking the feathers before they reach the fattening crates and when they begin it is hard to stop them. A little beef scrap added to the mash will sometimes prevent this. In one experiment it was thought that linseed meal aided in preventing this trouble. This habit is especially bad during hot weather. At this time the corn meal should be lessened and more bran and shorts added.

THE FATTENING CRATES

It is a very easy matter to make a fattening crate if it intended for only a few chickens and for home use. Commercial fattening establishments have crates made to order or else buy a large number of crates of a special kind from some firm which makes a business of manufacturing them. The main features which should be embodied in every crate are cheapness, sanitation or any easy method of cleaning, and a crate which is portable. Poultry is often bruised and loses weight in handling, and puts on fat more rapidly the less it is handled, and for these and other reasons it is best to have portable crates.

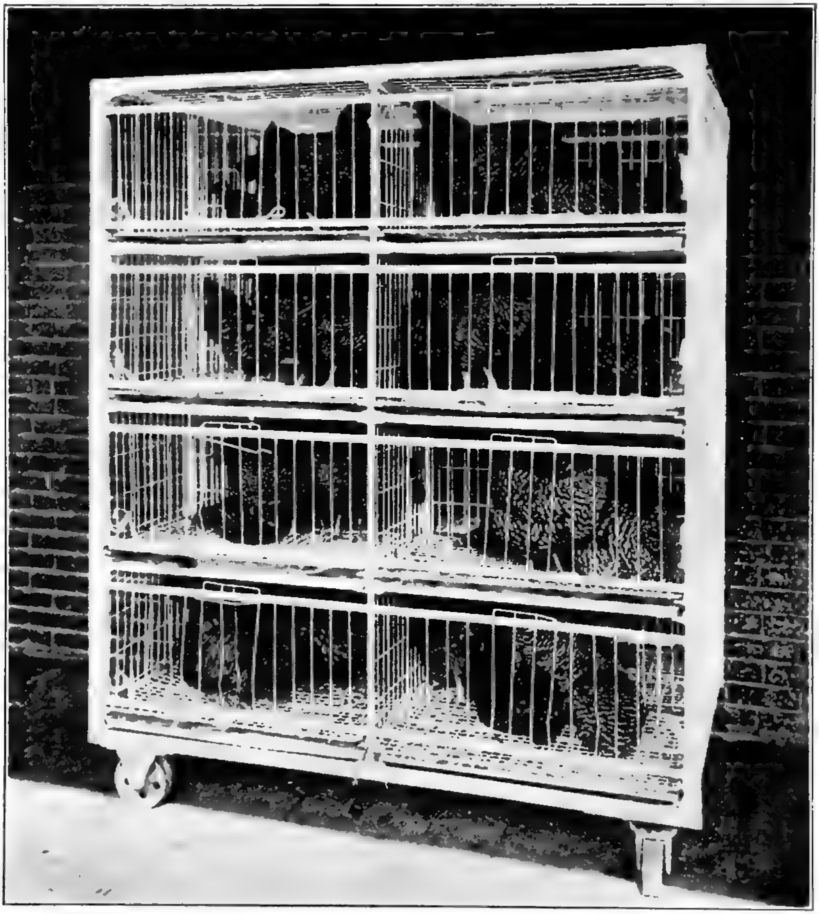


Fig. 17A. A modern wire and metal fattening battery, which has every convenience and is perfectly sanitary.

In the commercial plants, where thousands of chickens are fattened at one time, it is necessary to have a power mixer for the feed. The equipment also includes feed hoppers, tanks for the butter-milk, and the water is piped into the building.

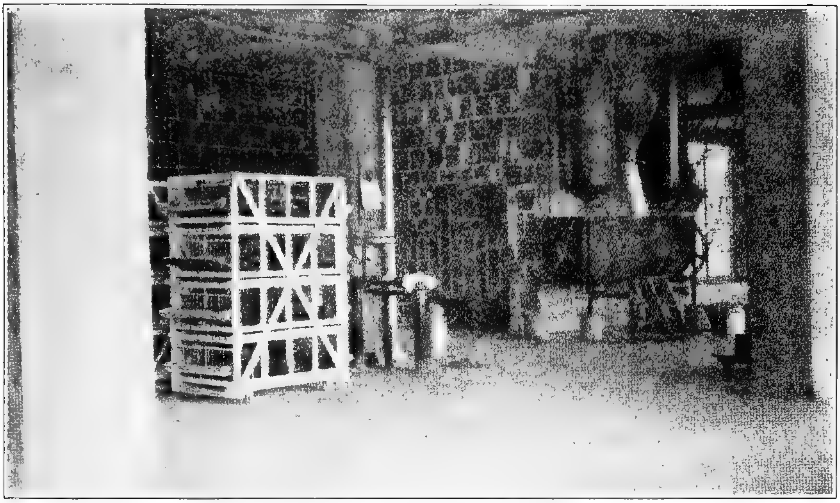


Fig. 18. A feed mixer is a necessity in a large fattening station where thousands of chickens are fed at one time.

METHODS OF KILLING POULTRY

Before attempting to learn to kill poultry you should acquaint yourself with the anatomy of the head of a chicken.

By having wire bottoms in the fattening coops, or some sort of crate that is self cleaning, you can avoid much trouble in having to wash the feet of the chickens at the time of killing. Also, the poultry should be starved 12 to 24 hours before killing, and should be given all the water they will drink. This method of feeding flushes the intestines and gives them time to digest all their food, so there is no fecal matter or food to taint he meat in any way.

One method of killing is what is known as the "block and axe" method. It is a method which is quite common on some farms. The chicken is killed by simply resting the neck on a block and severing the head with an axe or hatchet. The chicken should be held while dying or else put in a keg or barrel to prevent it from flopping about and bruising the flesh.

On many farms, the fowl is caught by the head and usually swung around by the hand until the neck is broken and the head severed from the body. Then the chicken is allowed to flop around on the ground while dying and becomes more or less bruised. When killing by the "block and axe" method it is a good idea to drive two large nails in the block, then put the chicken's head between the nails, stretch the neck out and you are not so apt to make a mislick when you attempt to hit it with the axe. This method is not the proper one to use in killing poultry for market purposes.

The English people use a method of killing poultry so that no blood is lost, but it collects about the neck underneath the skin and none gets out to soil the feathers or the clothes of the person doing the picking. The chicken's feet are held in the left hand and the bird drawn across the hip to give the person killing it more power so the labor of the operation will be lessened. The head is held in the right hand and the thumb is placed on the neck just back of the head so as to tell when the neck is broken. As you pull on the feet with one hand and on the head with the other, the head is turned backward, thus breaking the neck. This method should not be used where poultry is intended for market or storage.

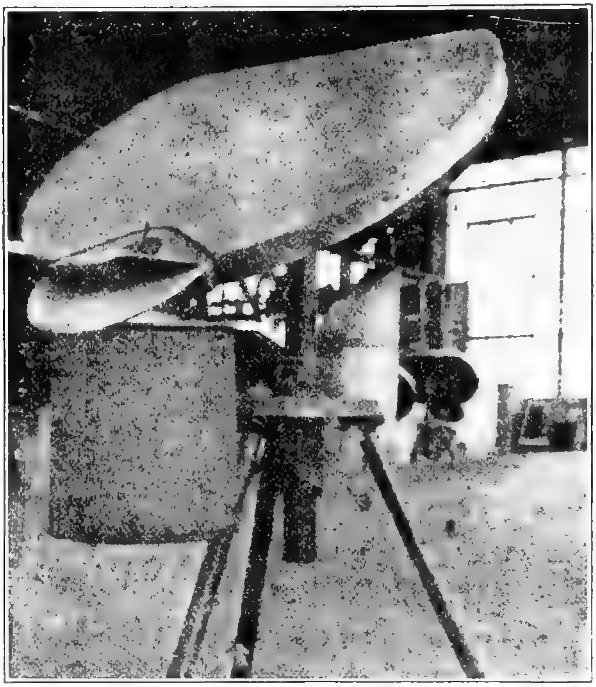


Fig. 19. A bench for killing poultry. Some like this better than the string method.

STICKING, BLEEDING AND DRY PICKING

Killing poultry by sticking it or braining it with a knife, then allowing it to bleed freely, is the most popular and best method where the poultry is intended for shipment or storage. The point of the knife is inserted into the brain which is reached through the mouth or by inserting the knife under the eye. In either case, the chicken is not properly stuck until it gives a "peculiar squawk." When this squawk is heard the muscles which hold the feathers are immediately relaxed and the feathers can then be readily and easily removed from the bird.

In using the string method, the bird is hung by the feet. The head is held in the hand with the beak towards you, the forefinger on one side of the head and the thumb on the other. It is very important that the killer acquaint himself with the exact location of the veins which must be cut in order to get a thorough bleeding. There are two veins, one coming down on each side of the neck and they are connected just above the juncture of the head and neck. As soon as you become proficient in cutting at the proper point for bleeding and learn just how to stick to get the "peculiar squawk," you have the problem of killing and bleeding solved and you make the labor of dry picking a comparatively easy one.

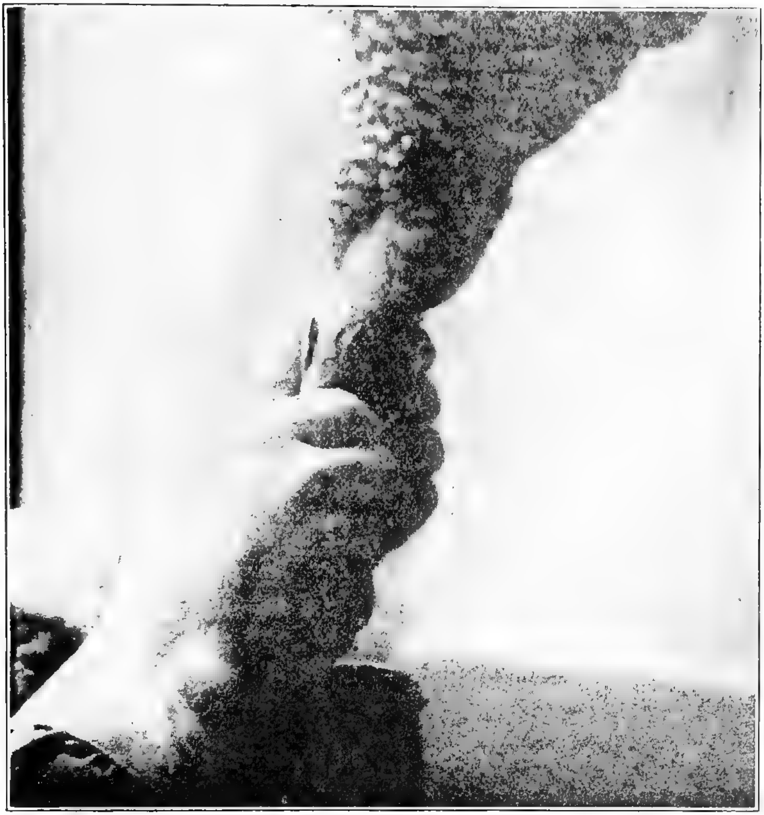


Fig. 20. Killing by the string method. Note how the head is held. The head is firmly grasped with the thumb on the one side, and forefinger on the other side of the jaw bone, thus permitting a free flow of the blood, when the cut is made. The ridge produced by the knife can be seen just between the wattles and half way up the bare place on the neck where the feathers have been removed to show this. Note, also, how the knife is held firmly and at the proper angle to get a good cut.

The point of the brain which must be penetrated can be reached by inserting the knife through the roof of the mouth, or under the eye. When sticking through the mouth, push the back of the

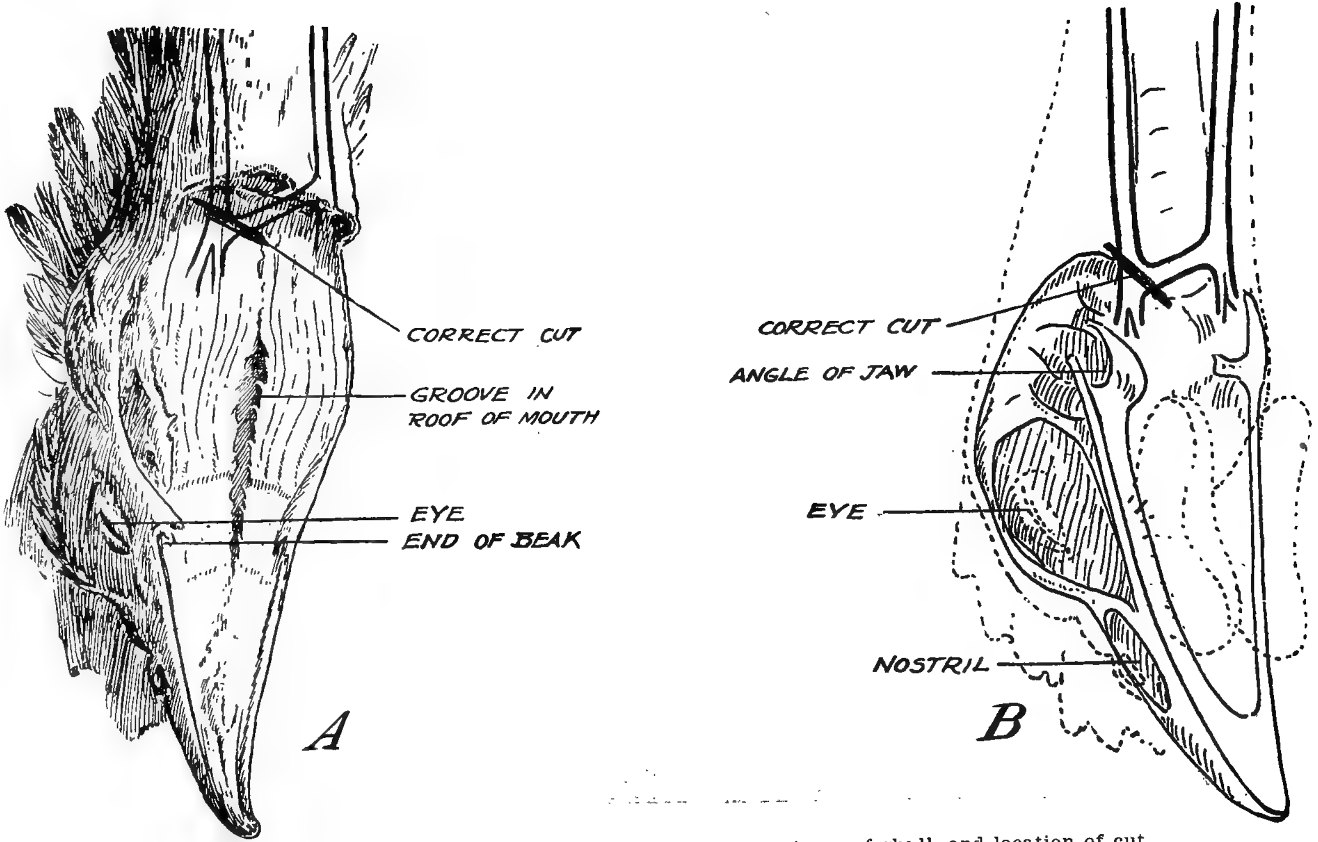


FIG. 21.—Lower jaw removed, showing position of veins, anatomy of skull, and location of cut.

knife in over the lower mandibile or beak. The knife is forced into the brain cavity, and then given a quick turn. Sticking under the eye is thought by some to be a simpler and surer way of killing. In case the latter method is used, the brain is reached by forcing the knife in just below the eye and at an angle so as to reach the brain in the center of the back of the head. Either method is not a success unless you reach the brain and get the "peculiar squawk," so that the bird relaxes the muscles which control and hold the feathers. As the knife is withdrawn, it should be pressed upward in the roof of the mouth, so that you will sever the bridges which connects the two veins. Then the plucking of feathers should be begun immediately, and as rapidly as possible, but carefully so that the skin will not be bruised or torn.

The wings are spread and the large feathers gathered in one hand and plucked with one pull. Repeat with the other wing. After practice, you can pluck the quills from both wings with one pull. The large feathers of the tail are removed next with one pull and a sort of twisting motion. The pickers should work rapidly but carefully. Remove the feathers from the breast, sides and back with a sort of rolling motion of the hand. Leave the feathers on the legs and wings until the last. This is what is known as "roughing" and pickers are paid one cent per chicken. Those who remove the small pin feathers get more pay because it is more tedious and slower work. After the roughing is done by experts in that line, the bird is passed on to the pinners to remove the small feathers.

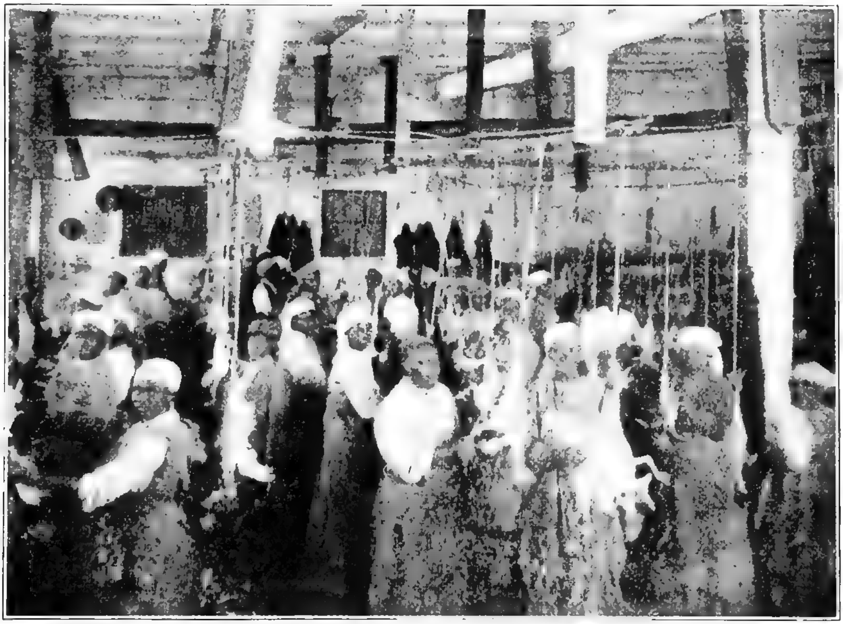


Fig. 22. Negro women being used for pinning and picking poultry.

They get two and one-half cents per bird for this work.

At no time should the hand come in contact with the bare skin of the bird. So care must be exercised in roughing, as it will cause what is known as a "burn" and will result in the chicken being placed in the second grade.

The old fashioned method of scalding chickens for market has practically gone oue of use. Dry picking is better and more popular. If you should desire to scald for either home use or market the best way of doing this is to take the feet in one hand and the head in the other. Then draw the bird through the water. Draw it with the feathers and not against them. In his way the steam loosens the feathers and the hot water does not reach or injury the skin. After the bird is picked, place it in cold water for a short time until the skin becomes firm. It will make the bird look plumper.

In practically all killing establishments, the head of the bird is wrapped in paper and this is considered very important. It prevents the blood from getting on other birds, and it adds to the attractiveness of the carcass. Paper or just the proper size and shape is sold by supply houses for this purpose.

Turkeys are killed like chickens and all feathers are removed except the short feathers on the last point of the wing. It is customary to leave these on.

Ducks and geese are bled in about the same way as the chickens, but it requires a longer bladed knife on account of the long beaks. After the ducks have been killed and well bled, have a large quantity of boiling water poured into a tub or vessel large enough to entirely submerge the fowl. Add about a pint of cold water and this will prevent the flesh from cooking on the wings and the tender portions of the bird. Place the ducks in the water and dip them up and down and work them about in the water until they are thoroughly steamed. Then take a cupful of this water and as you pull the feathers back the wrong way pour the water onto the duck and into the feathers. You will find it necessary to scald a duck at least twice as long as you do a chicken, but if this method is used it is not much more trouble to dress a duck than it is a hen. After you remove it from the vessel put the duck on a paper or table and pick the duck with both hands while the feathers are still warm. What little down is left can be removed by singeing. This method is recommended where ducks are prepared for home consumption, or for private trade.

Where large numbers of ducks are to be picked, it is best to have steaming closets. The wing and tail feathers are kept separate from the body feathers. The body feathers are marketed after beind dried.

FOUR METHODS USED IN PICKING FOWLS

There are four systems in use in killing and picking fowls. The string method, the bench system, frame killing and the lap method.

The string method is the most common. A large button which is on the end of a string holds the string in place after it has been wrapped around the legs of the fowl.

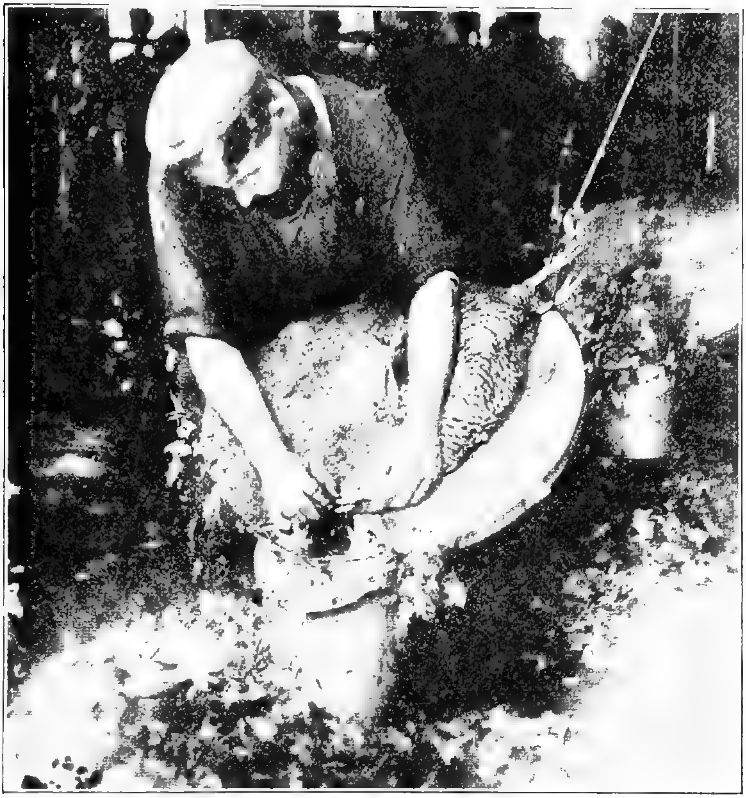


Fig. 23. Killing and picking by the bench method.

Women are more generally employed to pick the fowls and are generally paid according to the number of fowls they pick.

One person stands at the battery that contains the live birds, takes them out one at a time, hooks the button around the legs, runs the sharp pointed knife into the head and gives it a turn which paralyzes the part of the brain that controls the feather muscles. She snatches off the main feathers with a few jerks and passes the birds over to other women who pick off the small feathers, and pin them. The latter is the most tedious part of the work.

A sloping table is used in bench picking. The head of the bird is held over a hole under which is placed a bucket for catching the blood. Dr. M. E. Pennington claims that even when the bench is padded that the birds will bruise themselves. These bruises are not so noticeable at first but later they become breeding places for bacteria which bring about decay. By the string method there is little chance for the bird to be bruised and it is claimed that the work can be done more rapidly by this method.

After they have finished they hand them on racks. The heads are wrapped, the racks are then removed to the chilling room. Ice is not used to chill the fowls but they are carried to the refrigerator room that has a temperature of about 32 degrees. In this refrigerator room the atmosphere is dry rather than damp. This checks bacterial growth.

After they have been thoroughly chilled they are graded according to size and if they are broilers they are packed in boxes, one dozen to a box. Sometimes they are wrapped in paraffin paper which contains the trade mark of the firm. The birds are weighed and the weight stamped on each box.

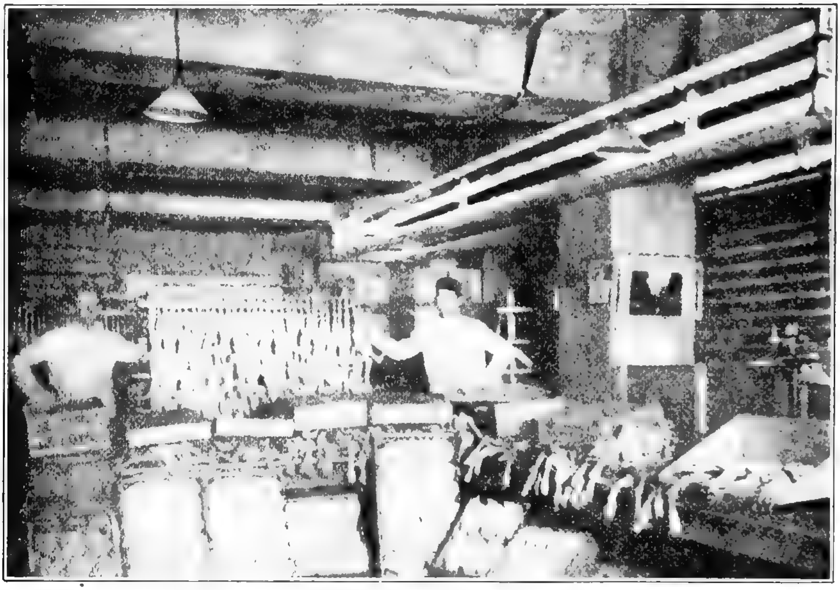


Fig. 24. A scene which tells a story of the process through which dressed poultry goes in the packing room. Killing rack, grading bench, weighing apparatus, and the packed boxes.

High grade roasters are often placed in individual boxes. Barrels are also used for roasters. These are also used for packing hens.

Broilers and roasters are often kept in cold storage for some time. When low prices prevail, many of them are held over to the season of scarcity. The dressed fowls are placed in refrigerator cars that must be cooled to the proper temperature before they are placed in them. The cars well insulated to keep out the heat and hold the cold air. There are hatches in each end of the car where the ice is put. A great deal of salt is also used to aid in lowering the temperature.

These cars are iced along the journey and hurried through to their destination.

There has been a vast improvement in the methods of handling dressed poultry in recent years. It is rare that expert packers have a car go bad. Only a short time ago the methods were crude and the losses great, but today it is possible for the Pittsburger or New Yorker to eat delicious milk fed broilers produced on a Kansas or Missouri farm and fattened in Kansas City and St. Louis, which would be far superior than if raised nearby, killed by crude methods and shipped in iced barrels or boxes.

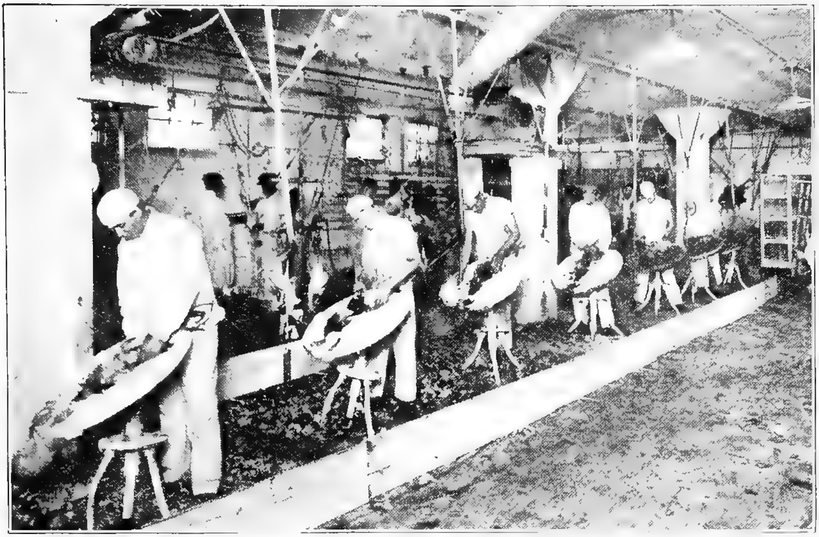


Fig. 25A. This shows the employees in a modern packing house killing and picking poultry by the bench method. You will note each man dressed in a white uniform and everything is kept clean and sanitary.

VALUE IN FEATHERS

The feathers are an important by-product provided they are properly cared for. The white feathers bring the highest price. For this reason they should be kept separated. The price of chicken feathers ranges from two to fifteen cents. Long, fancy feathers taken from the tails of roosters bring as high as 75 cents and 80 cents a pound. Goose feathers bring from 50 cents to 75 cents, according to quality. The wing and tail feathers of turkeys bring from 12 cents to 50 cents a pound. The feathers of chickens and ducks will usually pay the cost of picking if they are properly taken care of.

DRESSED POULTRY SHOULD NOT BE DRAWN

When the feeding period is over, the birds are starved 12 to 24 hours and they are not drawn. Experiments have shown that the drawn fowls decay much earlier than those not drawn. It is better for the butcher not to attempt to draw them at his shop, but this should be done a short time before they are put in the oven.

CHILLING, GRADING AND PACKING

The proper chilling of poultry is quite an important matter, after it has been killed and properly dressed. At least twenty-four hours are required to chill a chicken to the right degree before being packed for shipment. The best method of chilling is in a precooled room, one cooled by artificial means, and kept at a temperature of thirty-five to forty degrees.

The chickens are then graded and packed in attractive boxes, each varying in size according to the size and class of poultry contained therein. Each box is labeled, showing the contents of same.

PACKING HENS

Hens are side packed, double layers. First and second grade are packed in the same size box, but labeled differently. The label also shows the weight of the dozen fowls, which varies from 35 to 60 pounds per dozed and up.

Before the fowls are packed the sides and bottom of the box are lined with parchment paper.

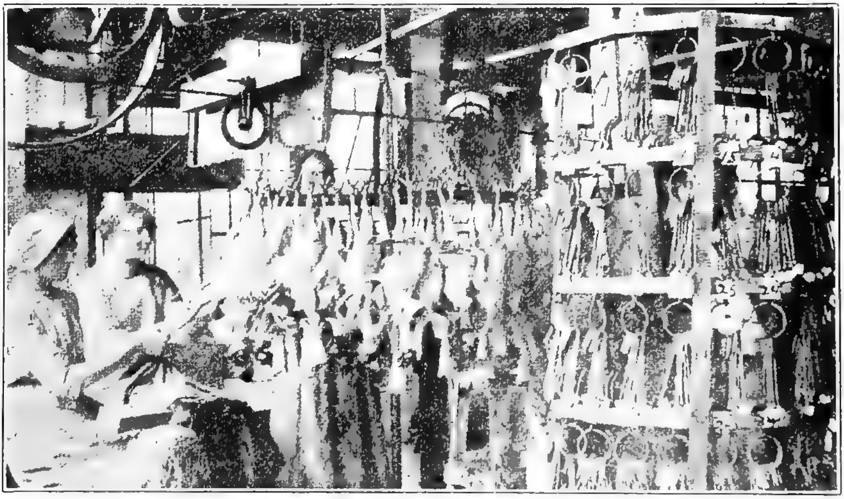


Fig. 25. The busy end of the killing room. The inspector stands just behind the rack of hooks which bear the number of the pinner. The birds are then hung on the rotating rack where the heads are wrapped. The finished birds are then sent to the chilling room.

PACKING BROILERS

Broilers are packed one dozen in a box, one layer, breast up. They weigh 18, 21 and 24 pounds per dozen according to the grade.

The broilers are first wrapped in parchment paper, which is dampened a trifle before being placed around the chicken.

PACKING OTHER GRADES

In all the sizes and classes of dressed poultry there is usually a second grade. The second grade includes poultry of the first grade, but is placed in this class because it may be torn a little, bruised or poorly bled. If this was mixed with the first grade, it would lower the price.

Some packing houses use a different size box from any other. Some pack in double layers and some in single, but most houses use both packs, depending upon the size of fowl being packed.

The cheaper and poorer grades of dressed poultry and cocks are packed in barrels.

When the birds are packed in double layers, the heads are folded on the right side. In packing single layers, the chicken is wrapped with the head folded on the left side. They are placed in the box in such a way as to make a very neat appearing package.

In some cases choice broilers and roasters are packed in pairs and sold in attractive cartons on which is printed the brand, grade or name of the particular pack.

SHIPPING DRESSED POULTRY

In shipping poultry long distances it is usually best to freeze it, but for short hauls this is not necessary, although in every case it is necessary to see that the birds have been thoroughly cooled before being packed and placed in the car. We have known of cars of dressed poultry being shipped from Kansas City and St. Louis that were almost a total loss before the birds reached the Eastern markets simply because they were not properly cooled before being placed in the car. Some precautions are necessary before shipping dressed poultry. After the poultry is packed in boxes, narrow strips are placed between each box so that there is some space between the sides, tops and bottoms. This insures the thorough cooling of every box or package.

About 10 to 25 per cent of salt is used with the ice in icing the car. Near the floor the temperature is about 10 degrees Fahrenheit, and as the boxes are packed higher in the car they come in contact with a higher temperature, perhaps 40 degrees near the center. For that reason the boxes cannot be placed too high in the car. They should be placed in the car in such a way that they do not slide about and thus damage the boxes and the poultry. The cars are sealed by the railroads and then re-iced en route when needed.

DRESSED POULTRY IN COLD STORAGE

According to Dr. Pennington, with the Bureau of Chemistry of the U. S. Department of Agriculture, the average time for storage for beef is 2.3 months; for fresh mutton 4.4 months; butter 4.4 months; poultry 2.4 months; eggs 5.9 months; fish 6.7 months.

The evils of cold storage are exaggerated. It is the only way to keep millions of pounds of meat of all kinds and many other farm products from going to waste.

"What is mechanical refrigeration?" A learned authority has said in effect that it was the production of temperature by machinery to solve an economic problem.

"What is the purpose of mechanical refrigeration?" The same authority has defined it to be the storage of the surplus of one year against the want of another year. The prevention on the one hand of low and unprofitable prices for farm products at harvest time; and on the other hand high and excessive cost of farm products at using time. In addition to this definition I will state that mechanical refrigeration is not similar nor analogous to the refrgeration produced by an ice-house or ice stored in a box or room for that purpose. Mechanical refrigeration freezes all the moisture in the refrigerating chamber, turning it into ice. Ice-house refrigeration is the cold released by melting ice and promotes the growth of bacteria, fungoids and mold. Mechanical refrigeration is healthy and products are improved by its use. Ice-house refrigeration is unhealthful and products constantly deteriorate therein."

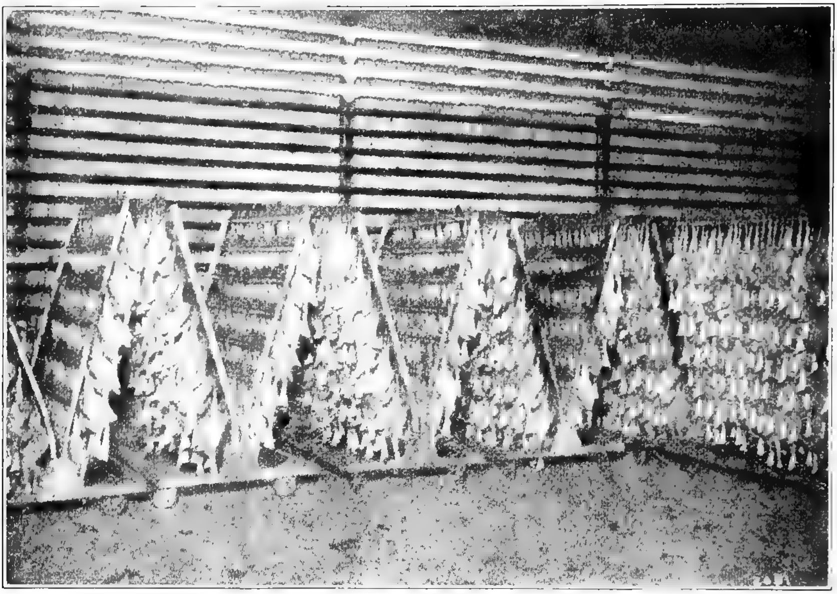
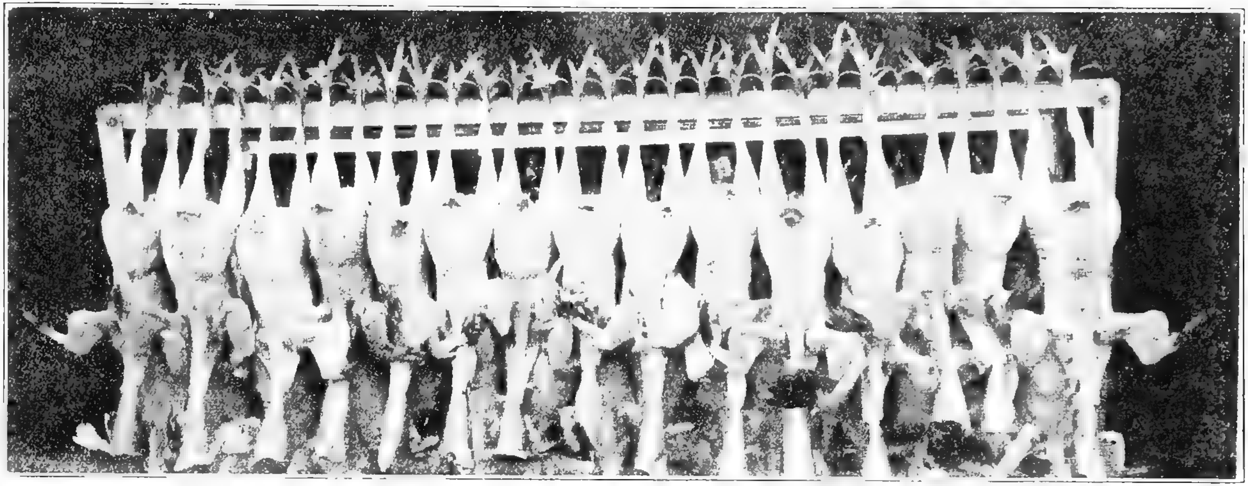


Fig. 26. Poultry on the cooling racks. These are shown in the refrigerator room. The chickens are kept there until they are thoroughly cooled out and ready for packing.

PROPER METHODS HELP INCREASE QUALITY AND PRICE

There are many errors that can be made in the handling of dressed poultry, which lower the price and often render the birds unfit for food. The plump, well fattened bird will sell more readily and for a better price than the scrawny bird even though they weigh the same. If all of the birds have not been well fattened it is better to put birds of similar quality in the same package. One or two birds that are inferior in quality can lower the price on every bird in the box. Birds that are not well picked will not bring good prices although the eating quality might be excellent. The white feathered birds do not show this defect so readily as do



Well-bred fowl, well-fattened and properly dressed, hanging on the cooling rack, preparatory to being packed for shipment. The fowls are shown as they are dressed for high-class commercial trade, with a few feathers left on each wing, which is a sort of trademark for this class of fowl. Wrapping the heads in paper is also done for a certain class of the trade. Dressing refers only to a fowl that is killed, bled and plucked. A dressed fowl is not drawn. In order to supply a high-class market fowl, such as is called for by the best trade, the stock must be well-bred and then must be fattened especially for the market. Poorly-bred or mongrel stock does not make good market poultry and, when offered for sale, such stock brings less money than the well-bred, well-fattened fowl.

birds with black feathers. Care in this direction will be well paid for in the increased price.

It is absolutely essential that birds be well starved just before killing. There is not so much danger of the birds spoiling, and it is found after they go to market that if there is food in the crop it disfigures them to take out the food and if allowed to remain, the soured food will hasten decay.

The voidings in the vent should always be emptied. Any fecal matter is more or less likely to contaminate all of the birds in the box.

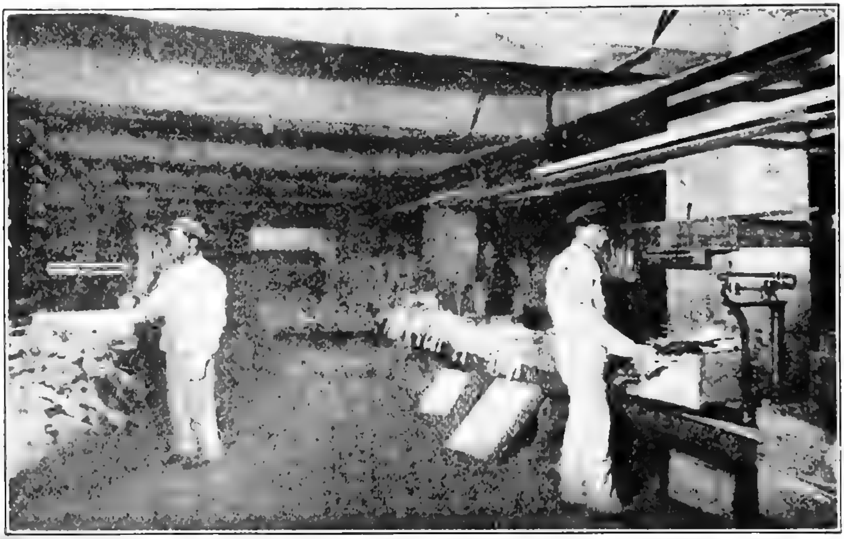


Fig. 27. Dressed poultry being weighed, graded and packed. This work is done in the refrigerator room.

Birds that have not been properly bled or that have been torn while dressing must be sold at a much reduced figure. The birds are filled with red spots throughout the body and there is a discoloration of the neck and hips. Every precaution should be taken in preparing birds for market. Skillful packing houses that use up-to-date methods seldom lose any birds from improper handling.

They put out a highly specialized product and would very quickly lose their trade if they should put inferior goods on the market.

The old style stationary battery has been displaced on modern plants. The portable battery can be readily moved and placed in the elevator to be carried to any floor of the building.

A KNIFE FOR KILLING POULTRY

By H. C. PIERCE,

Food Research Laboratory.

The knives in common use in bleeding and braining poultry are not suited to their purpose. The blades are too broad and too long and the curve at the point should be on the back instead of on the cutting edge. The handle is so large that the killer is encouraged to use too much force in making the cut bleed, whereas a light touch of a sharp knife, properly directed, is all that is needed to cut the blood-vessels. The knives are also unsanitary in that dirt collects at the junction of the blade and the handle.

The knife which is to be used to bleed and brain poultry should be small, with a narrow blade; stiff, so that it does not bend; of the best steel, so that it can be kept sharp and is not nicked when used in braining; and the handle and blade should be in one piece. Such a knife, with the aid of the packing-house emery wheel or grindstone and oil-stone can be made from an 8-inch flat file. (See Fig. 28a).

To make this knife the blade should be shaped from the small end of the file, as shown in figure 28b. It should be, for chickens, two inches long, one-fourth inch wide, and one-sixteenth inch thick at the back. For turkeys the blade should be two and one-half inches long. The curve to make the point should slope from the back downward. A blade of this shape reaches the blood vessels to be cut more surely than does a blade on which the point curves upward. After the blade is made, the ridges on the file should be ground down, leaving just enough roughness to prevent the knife slipping in the hand of the killer. The handle should be five inches long.

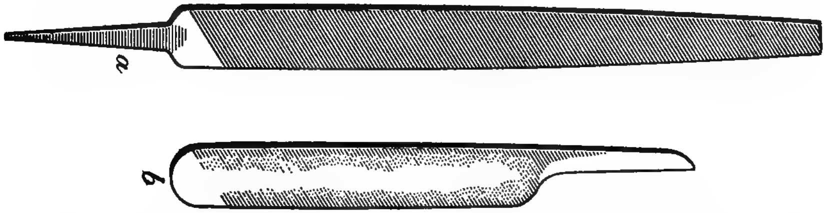


Fig. 28A. Knife for bleeding and braining poultry; a, file from which knife was made; b, knife.

BROILERS — HOW TO PREPARE THEM FOR MARKET AND KITCHEN — A VALUABLE SUGGESTION FOR WOMEN WHO TAKE PRIDE IN THEIR COOKING — A PROFITABLE HINT FOR RETAIL POULTRY DEALERS

By WM. WINCHORST

Careful and skillful selection of a broiler on the open market has much to do with the palatibility of a chicken. In selecting a broiler particular care should be exercised in choosing one which is plump and fat. Fattening does not mean to fill the body with lumps of fat, but put fat between the muscles to make the bird juicy and tender. Fattening in this way improves the weight and the quality and commands a higher price; especially to milk fattended broilers bring high prices in early season.

The color of the skin very often influences the mind of the purchasers, but has in fact nothing to do with the quality of the meat, and after a chicken is broiled, roasted, or fried to a nice golden brown it is impossible to determine whether the color of the skin originally was white or brown. A good product suited to market demands should be clean and attractive, and properly bled. It should also be starved 12 to 24 hours before killing in order that the crop and intestines be empty at the time of killing. The bird should be dry picked. Improper bleeding is

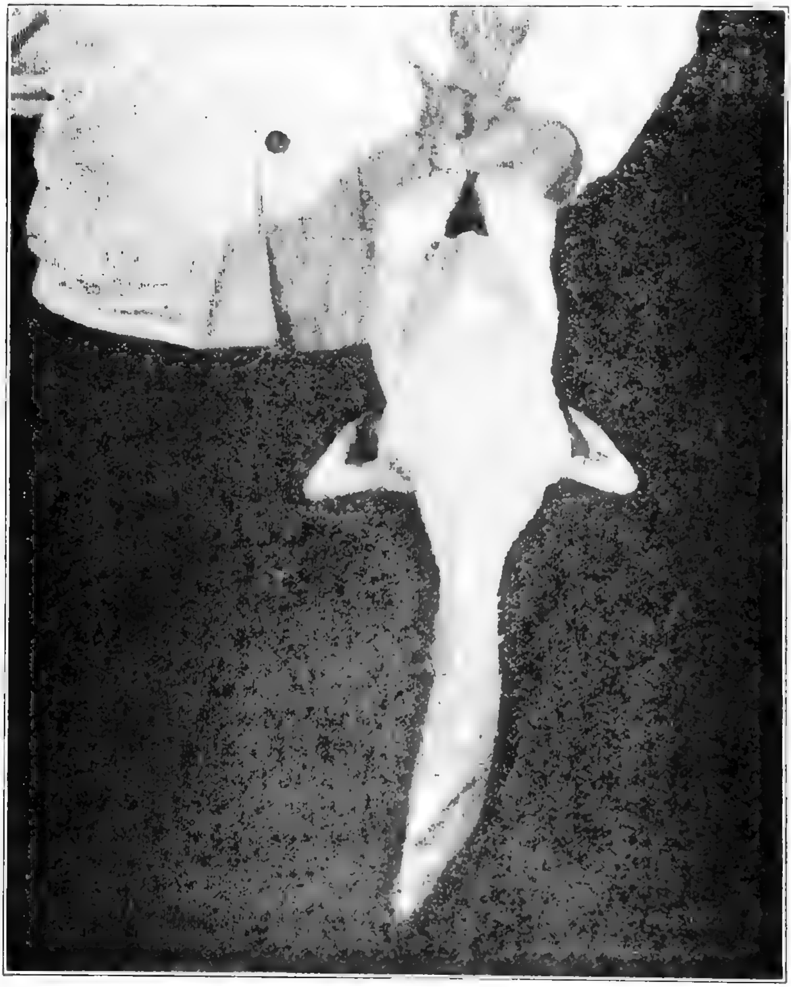


Fig. 29. Note the head has been wrapped before the bird is placed in package. Note the full body, the width between the legs, abundance of breast meat, and heavily meated legs and thighs. Such a fowl is the result of good breeding and good feeding.

detected by the presence of a lump of blood in the neck of the bird. Inferior or wet picked, also inhumane handling during the killing process may be told by a bruised skin. Proper bleeding and dry picking in a chicken is important, as this will prevent any chance of decomposition, and the same holds true whether a chicken is drawn or undrwan. A chicken with the entrails removed will not only decompose more quickly, but many dealers will remove the entrails and the head so as not to show the symptoms of some poultry disease, which is sometimes prominent on the inner organs. All this is important, and a nice looking and attractive product will give us the assurace that it was raised, handled and prepared by experts knowing the details of the business, and giving the product a much higher market value in comparison with the product prepared by amateurs.

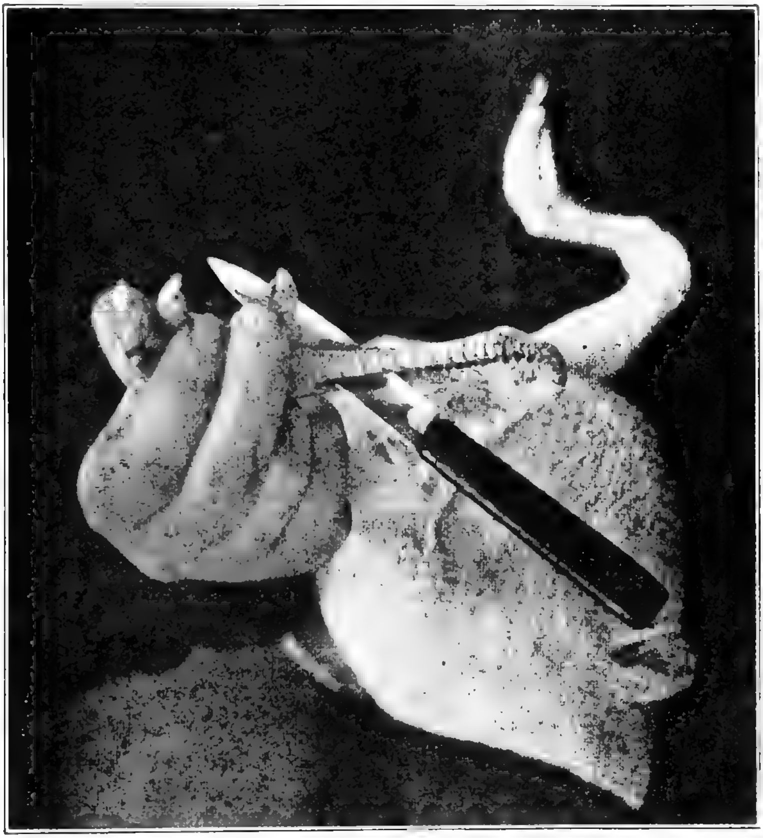


Fig. 30.

Singeing a chicken is best done with a tablespoonful of alcohol poured on a pie plate and is much superior to singeing over an open kitchen fire or with newspapers.

A chicken as shown in illustration Fig. 29, nicely killed and picked, is not only more attractive but also more sanitary.

The first operation in dressing a fowl should be the removal of the tendons from the chicken's legs in order to make the first and second joint more tender and almost as delicious as the white meat on the breast bone. The tendons are seen daily in the butcher shop. The strong sinews by which the butcher hangs up a side of beef or pork are similar to those to which I refer here. It is the material used by the Indians to make bow strings, and it may easily be realized that these tendons will toughen the meat. In Turkeys these tendons are especially prominent. In order to remove the tendons, insert a sharp peeling knife on the reverse side of the lower leg, and make a long, wide cut as indicated in Fig. 30 at the dotted line. Lifting the scaly skin with a nail, spike or screw-driver, the seven tendons are visible. Until one becomes proficient it may be advisable to take only one of the tendons on the spike at a time. Twist once around and pull gently, but firmly. (Illustration No. 31.) It is an operation which may be easily per-

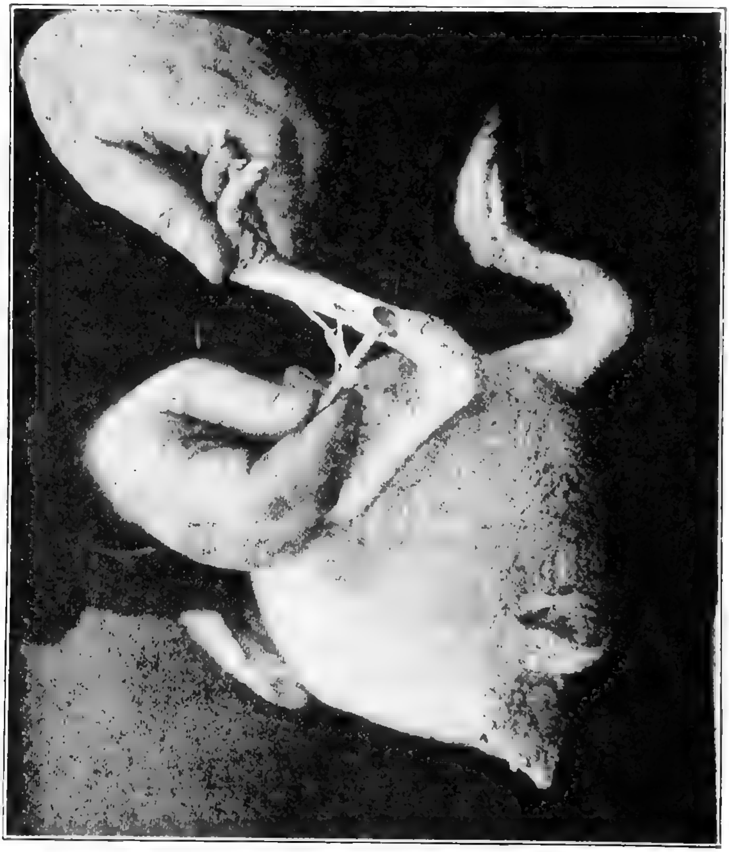


Fig. 31.

formed by a child. The extreme lengths of the tendons demonstrate plainly how far same go up in the meat of the drum-stock.

In cutting the leg many women cut it above the joint or labor hard with a blunt peeling knife to sever the leg from the body by cutting through the joint. Both methods are wrong, as the meat will shrink, leaving the exposed leg bone sticking out of the meat in a very unsightly way. A cleaver or chopping knife is the right

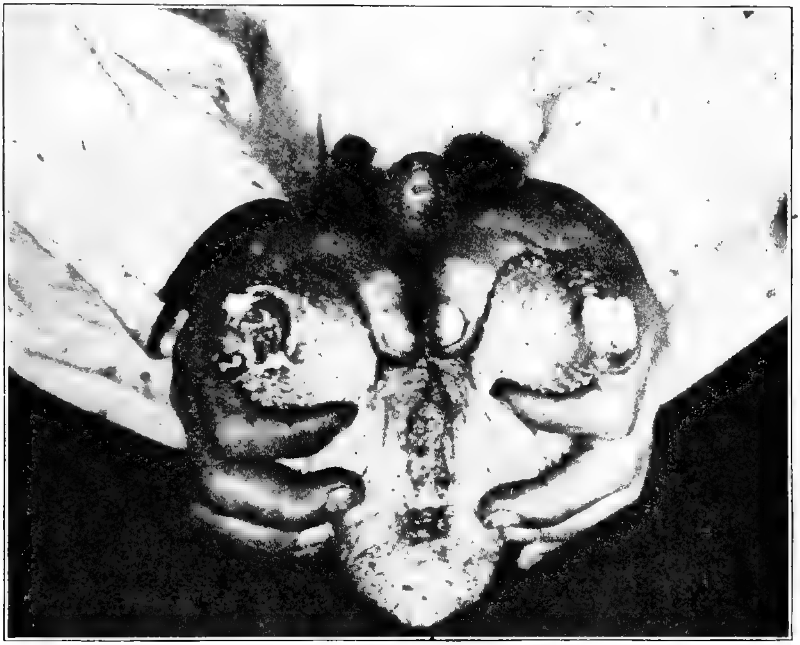


Fig. 32. The left side shows a foot improperly cut off. The right shows a foot properly taken off.

tool to cut off the leg, thus preventing the shrinking of the meat. If preferred, the joint may be cut off after cooking, and just before serving. A cleaver is a very handy kitchen tool, found only in a few kitchens. While not necessarily very large, a cleaver should be fairly heavy and be made out of steel. Small "tin cleavers" bought in a five and ten cent store do not serve as a substitute.

Illustration No. 33 shows the removed tendons as well as the exact position where the cut should be made.

The neck may be cut off with the cleaver close to the body. One does not need to draw the broiler or fryer as is practiced when you roast a chicken. A time saving method for preparing a broiler is shown in illustration No. 34. Set the chicken on the rump and insert a strong bladed non-flexible kitchen knife in the middle of the back, just along the side of the back bone and cut clear down. Turn the bird around, insert the knife about the same place and cut towards the front. Inserting the knife exactly in the middle of the backbone requires more strength, and will not aid in removing the back bone, as will be shown later. Cut out the spine as shown by dotted lines A and B in illustration No. 34. Lay the body open and then remove the entrails as shown in illustration No. 35.

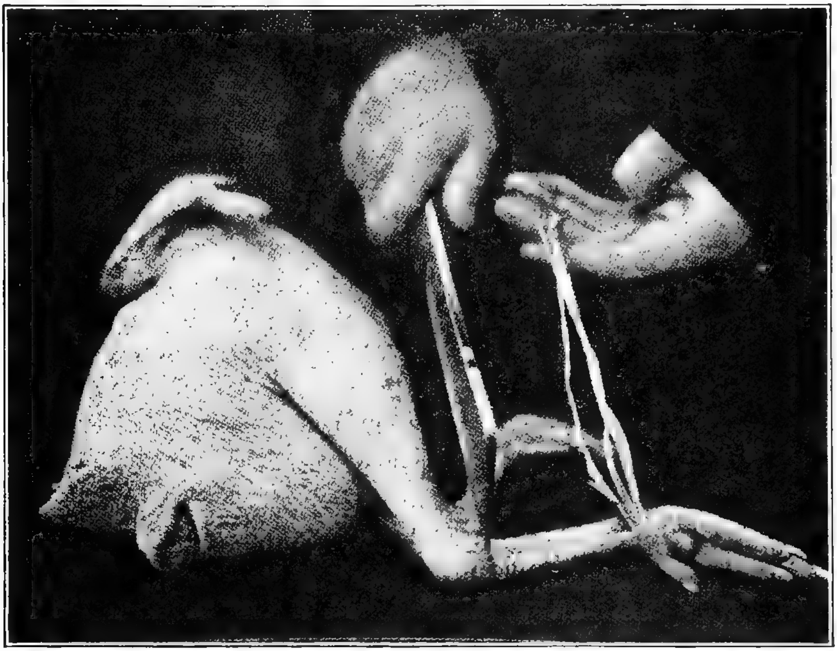


Fig. 33.

Care must be exercised so as not to tear the intestines or gall sack attached to the liver, and, also, proper pains taken in removing the crop. Very numerous are the cases where newly wedded ladies forget to remove this feed container from the bird's body. The dotted lines C and D, Fig. 34, illustrate where a cleaver cut should be made in order to remove the hip bones.

Illustration No. 36 gives evidence of a very skillful manner by which to remove the bone from the leg without making any cut or incision on the outside of the leg.

Resting the carcass on the table, get a firm hold of the leg with your left hand, take the knife in your right, and scrape the meat from the bone, allowing the meat to fall over, by gravity, all around till the joint is reached. Still firmly holding the leg with the left hand, a little cutting will be necessary to remove the meat from around the joint. Once over the joint the battle is won, and by scraping again, and letting the meat fall all around over your left hand the meat will finally be removed from the bone. The bone should be chopped off so as to allow the last stub of the bone to remain in order to preserve shrinking as well as to maintain the shape of the leg.

Removing the ribs is a very easy task. Push one of your fingers between the meat and the rib bone, and the knife may finally help in severing the ribs from the breast bone.

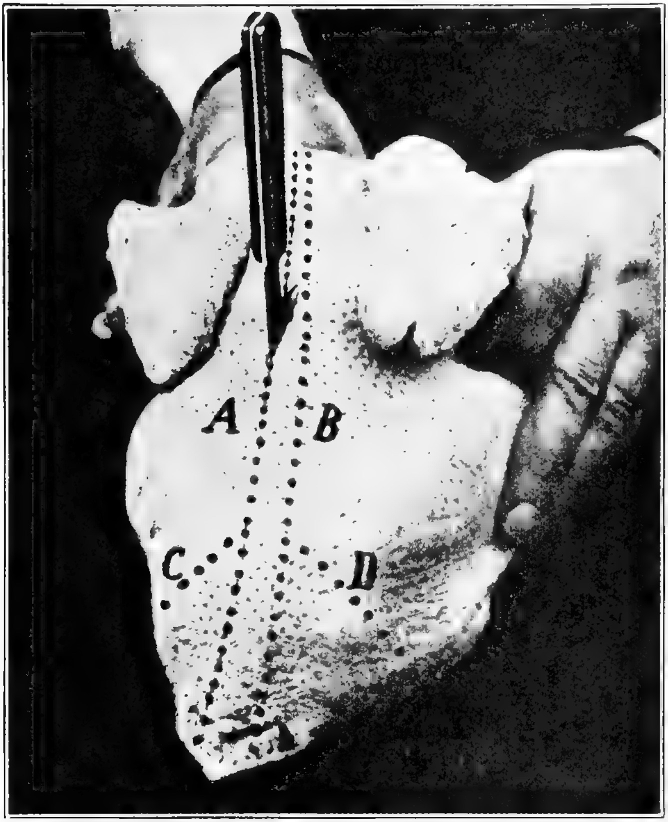


Fig. 34.

The breast bones are plainly visible now, and it may be well to follow the outline of the different breast bones as shown in illustrations 37 and 38. Do not try to break any bones, but by using your fingers as much as possible, and the knife whenever necessary, the meat will be taken off. Remember that the breast bone itself resembles very much the "T" bone in a Porter House steak, and a close observation regarding the peculiar shape of the breast bone will assist greatly. As soon as the breast bone is well exposed, as shown in illustration No. 38, a little pull may help in the operation. The breast bone is only joined now with the wings, and a cleaver cut on both sides as indicated by the knife will enable you to remove the breast bone entirely from the body. The wish bone is not hard to remove, and after allowing it to dry over the kitchen range it may secretly be placed back before serving. The wing

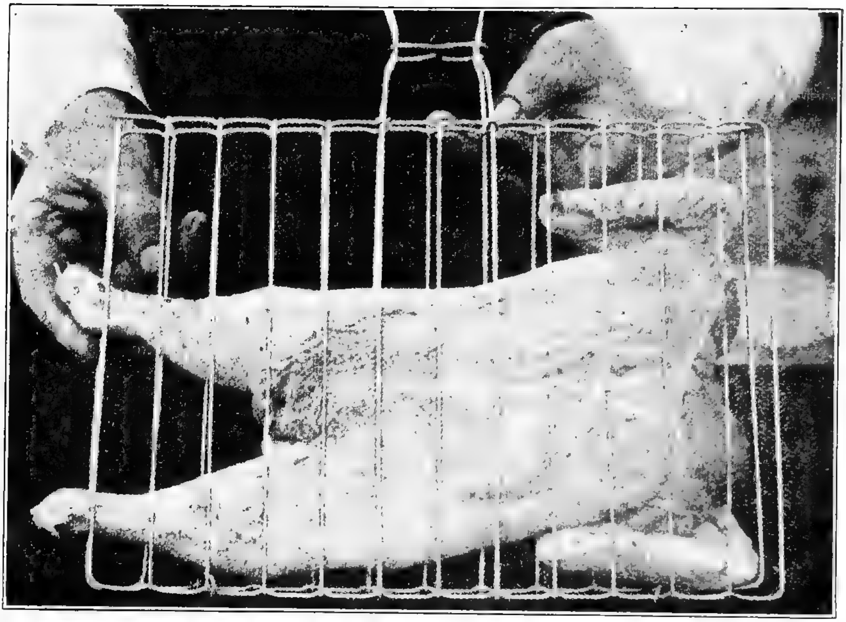


Fig. 39. This shows the bird neatly arranged on a wire toaster ready to be placed on the broiler.

bones are better to remain in the body, as there is not much meat on a broiler's wing and the shape will be preserved.

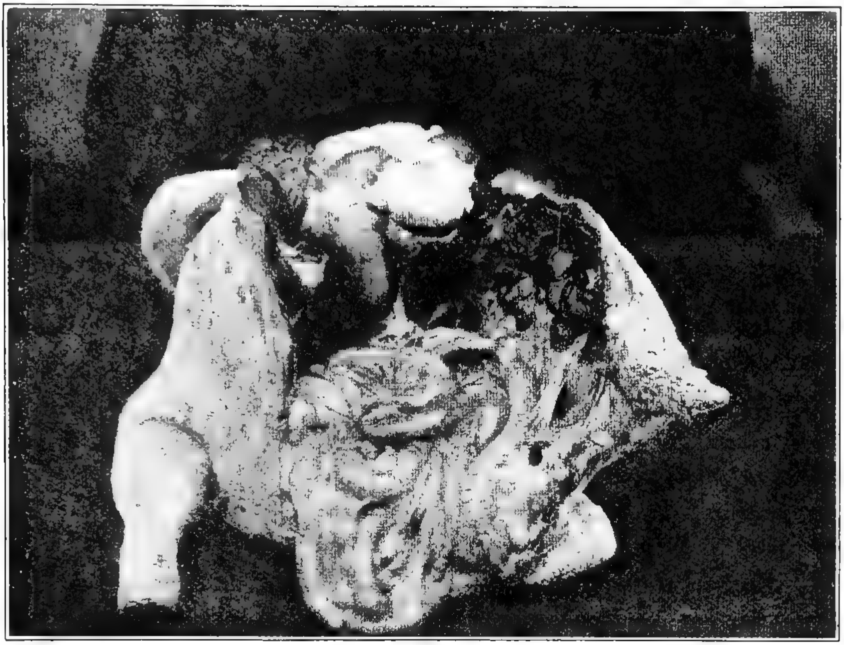


Fig. 35.

The only difficulty now may be that the carcass looks like an unsightly mass of meat, and in order to overcome this difficulty arrange the broiler neatly on a wire toaster, Fig. 39, and while still held by this toaster, place it on the broiler. Cook it slowly to a golden brown till the thick parts of the leg meat are really done. Nothing is more disgusting than a broiler with the raw juice still running out of some parts.

For frying, the same method of boning may be practiced, and prove of great value where "breaded chicken" is desired. Due to the fact that starting from the extreme stub left in the legs up to the wings not a bone is left in the body, the appetite of the family will increase immensely when they find out that the broiler or fryer may be cut with a sharp steel table knife, like a slice of beef or ham, and the person is not hindered in eating by the numerous bones, enabling everybody to eat like well bred people do, and mannerly. With only a little practice and good will, the entire work may be done in from five to eight minutes.

Boning a broiler or fryer before cooking is as important as carving and boning a roaster or broiled fowl for fricassee, after cooking. Carving is kitchen work and should be done in the kitchen. The old method imported from England to carve a chicken in the dining room may be in place where it was originated. Is it not

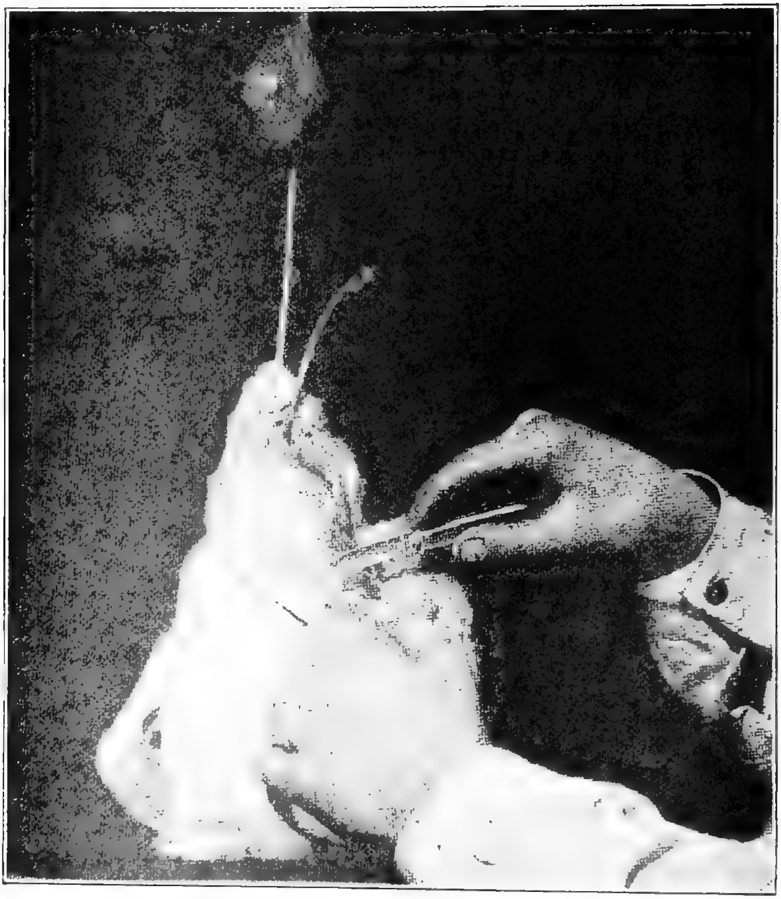


Fig. 40. A method of boning which is recommended by Prof. Mixa. He hangs the bird up in this manner and works from the neck down. We like it better than most any other method. Practice makes perfect with either method. This shows how the bird is hung from the neck and breast bones and how the knife is held when cutting the meat loose from the bone.

a torture sometimes to see father carve, especially when he does not know how? Is it not embarrassing when he blames the blunt

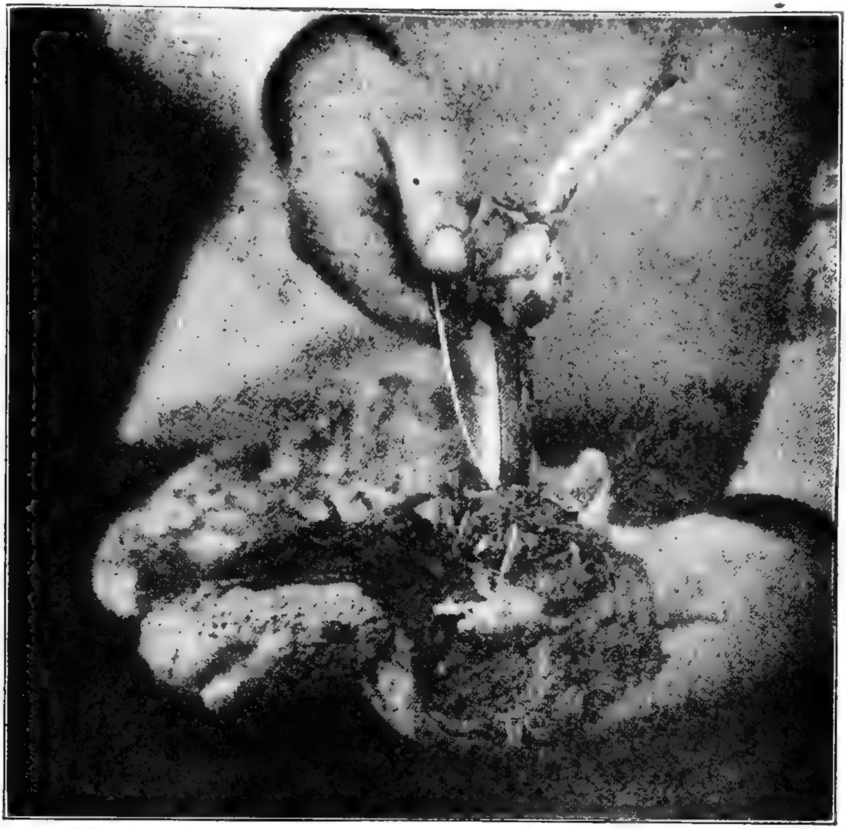


Fig. 36.

carving knife or says the chicken is not cooked enough? And is it not a fright when he spills the gravy over the clean Sunday table cloth, and in such a way spoiling the appetite of everybody present?

The writer received many thanks for demonstrating this method of boning and trussing to many progressive housewives. A small number said, "Well, but my husband likes to gnaw a chicken bone." Such an explanation gives more credit to a patient husband than to his wife; he simply does not know anything better to do with the chicken served to him. Try this better method only once, and if he is persistent, cook the bones also and let him knaw to his heart's delight.

The economical housewife will regret the large waste which goes with the bones, and particles of meat left on them, but do not sigh. More waste will go in the garbage pail if you serve the chicken with bones than there will be if you remove the bones, and all bones removed from the chicken, together with small parts of meat,, giblets and feet will be of great value for a good chicken soup, or served as stock for rich cream of asparagus, or will add great flavor to any soup you decide to make, and nothing will be wasted.

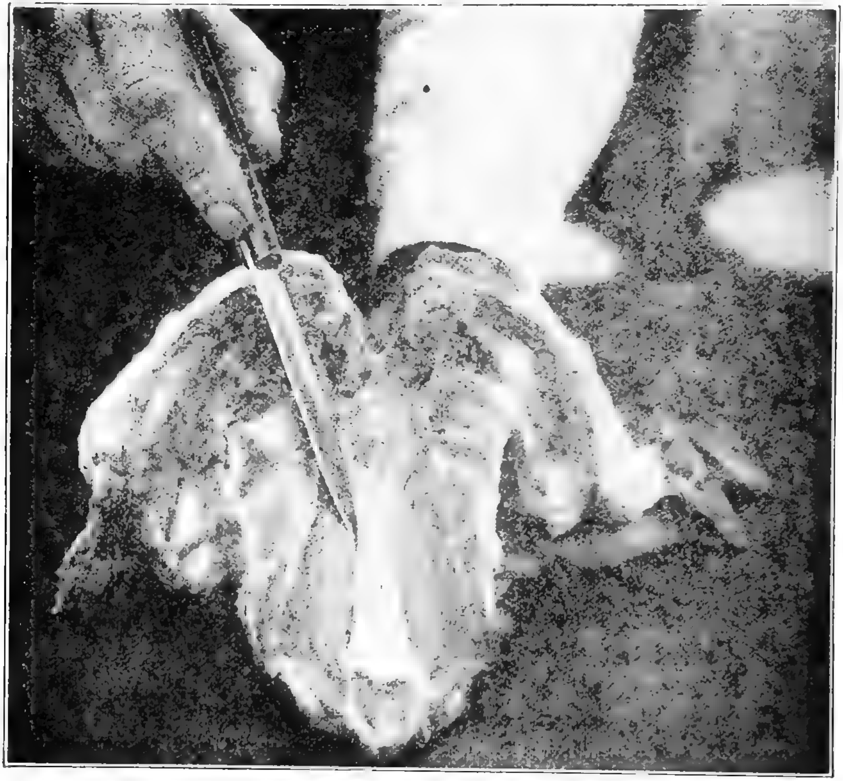


Fig. 37.

A time will and does come in every woman's life when she will take great pride in her cooking. It may be that visitors will make their appearance, or guests are invited for a party. The way to a man's heart leads through the stomach. You will see smiling faces around your table, and everybody will give a compliment to the woman that knows how to cook. The boys will say it is "chicken like mother used to make."

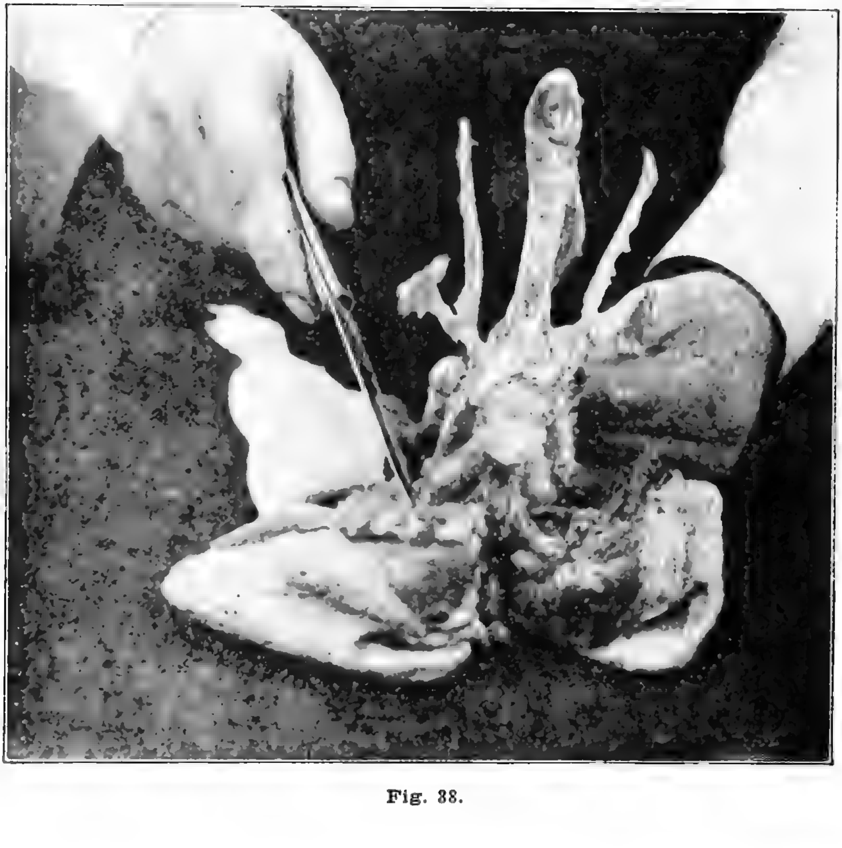


Fig. 38.

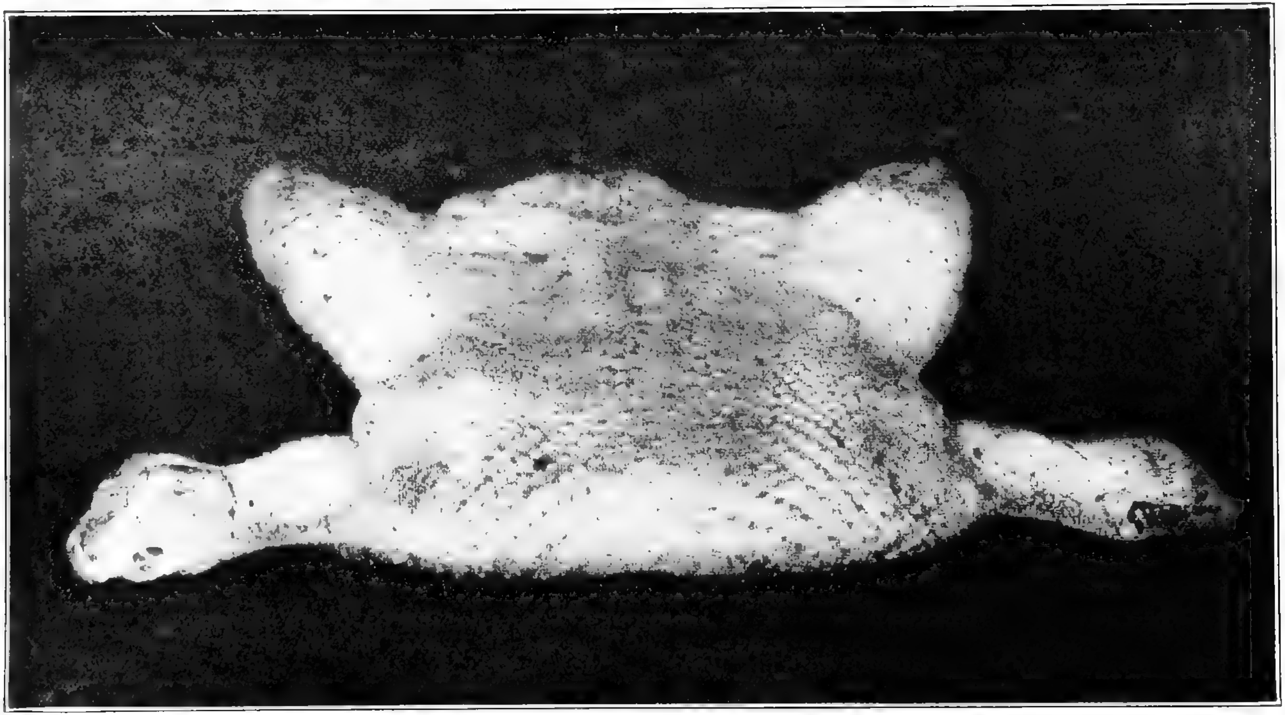


Fig. 41. A chicken from which all bones have been removed. When it is carved and served, it is possible to serve a portion of white and a portion of dark meat with each service.

QUESTIONS ON LESSON 31, MARKET POULTRY BUSINESS

1. What is considered the best feeding season for fattening poultry?

2. What advantage has the crate method over the pen method of fattening?

3. What length of time can chickens be fed with profit?

4. How should the fowls be handled and fed just before being killed?

5. In killing a chicken by inserting a knife into the brain, how would you know when the bird was properly stuck?

6. When should the picking begin, and what portion should be picked first?

7. What advantage is there in wrapping the head of the chicken in paper after it has been killed?

8. Does dressed poultry keep better when drawn or not drawn?

9. Why should poultry be thoroughly cooled before being packed and shipped? How is this done?

10. In what way is dry picking better than scalding?

INDEX

A

Page

Average Income Per State 7

B

Best Breeds for Broilers 9
Boning Poultry 47-61
Breeding Market Fowls 8
Broilers—How to Prepare for Market and Kitchen 47

C

Channels of Trade for Poultry and Eggs 19
Chilling, Grading and Packing 42
Classification of Market Poultry and Market Demands 12
Cost of Production 3

D

Dressed Poultry 17
Dressed Poultry in Cold Storage 43
Dressed Poultry Should Not Be Drawn 41

F

Fattening 48
Fattening and Conditioning for Market 21
Fattening Crates 32
Fattening Hens 27
Four Methods Used in Picking Fowls 38
Feather Picking 31
Fattening With Whole Grain 26

H

How Shall We Sell Market Poultry? 6

K

Knife for Killing Poultry 46

M

Methods of Killing Poultry 33

P

Packing Broilers 42
Packing Hens 42
Packing Other Grades 42
Poultry Grades 17
Proper Methods Help Increase Quality and Price 44

Q

Quality Increases Price 5
Questions on Lesson 30 20
Questions on Lesson 31 61

R

Removing Birds When "Off Feed" 31
Removing Tendons 50

S

Shipping Dressed Poultry 43
Singeing a Chicken 49
Sticking, Bleeding and Dry Picking 34

T

Table Comparing Amounts, Uses and Values of Products From a Fattened Roaster 11
The Waste in a Roaster 10
Too Many Middle Men 8

V

Value in Feathers 41

CAPONS ARE PROFITABLE

BY T. E. QUISENBERRY

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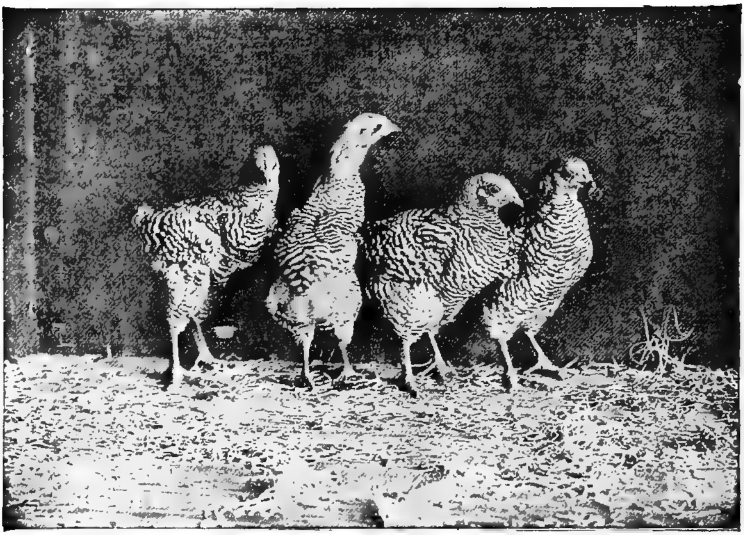
ONE GREAT drain upon the poultry industry in past years has been that caused by poultrymen having to market practically one-half of their young stock each season at a loss, or at little more than the mere cost of production. The young males are too often allowed to grow staggy, and are then placed upon the market at a price which does not cover the cost of production.

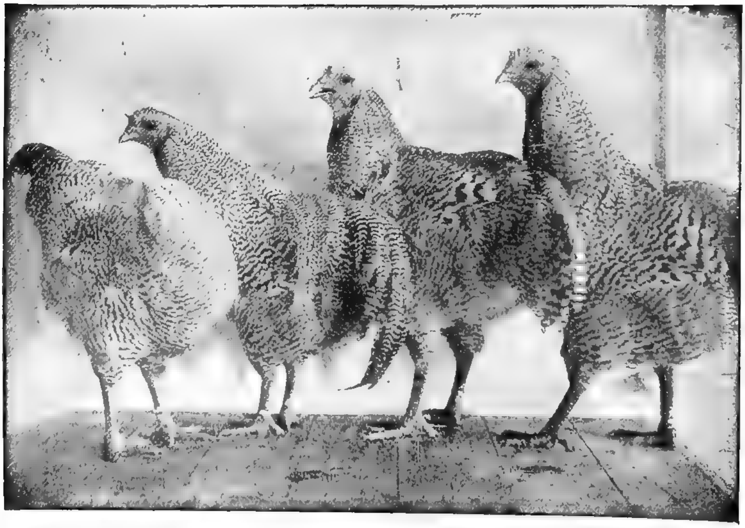
The caponizing of a large portion of the surplus cockerels is going to aid to a great extent in the solution of this problem and the saving of this loss. In proportion to the amount invested, the caponizing of the

Truly this is "King Capon." This bird has a big frame, good shape and beautiful color. He would have sold for just 24 cents at the time he was caponized. He was caponized on September 1st and this picture was taken on April 1st, at which time this Capon would have sold for at least $2.50.



Four cockerels as they appeared the day they were caponized. They were six weeks old at this time.

surplus cockerels is going to prove more profitable than the castration of male calves and the production of beef cattle. The capon industry in the poultry business corresponds to the beef cattle industry in the live stock business. We unhesitatingly recommend this practice among all farmers or commercial poultrymen, for "Capons Are Profitable." Whenever you cannot secure as much as twenty cents per pound for your cockerels you can afford to caponize them.



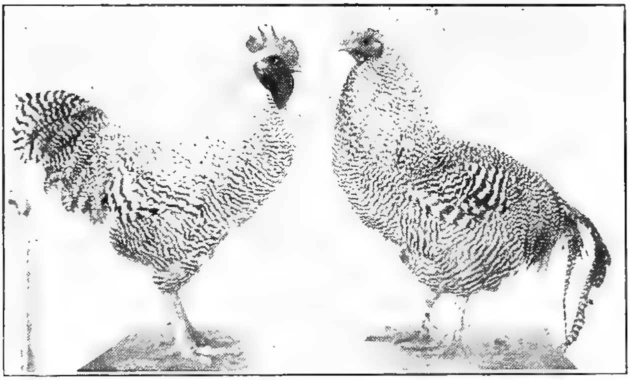
The same four birds after they were caponized and had reached the age of seven months.

We are greatly indebted to Mr. George Beuoy, who is well known as the "Capon King," for a great portion of the information contained herein. Mr. Beuoy undoubtedly caponizes more birds each year, and teaches more people how to properly perform the operation, than any other living poultryman .

Thousands of cockerels are marked every season at a price that hardly pays for the feed they have eaten, to say nothing of the care and trouble required to raise them. Why hold your males until they become staggy, develop small spurs, weigh from four to six pounds, and sell on the market for only 15c to 40c each, depending on the size, quality, and market conditions? These same cockerels as capons would weigh eight to twelve pounds each and bring from eighteen to twenty-five cents per pound, live weight. If you don't expect to caponize them, then sell your surplus cockerels as broilers or fryers.

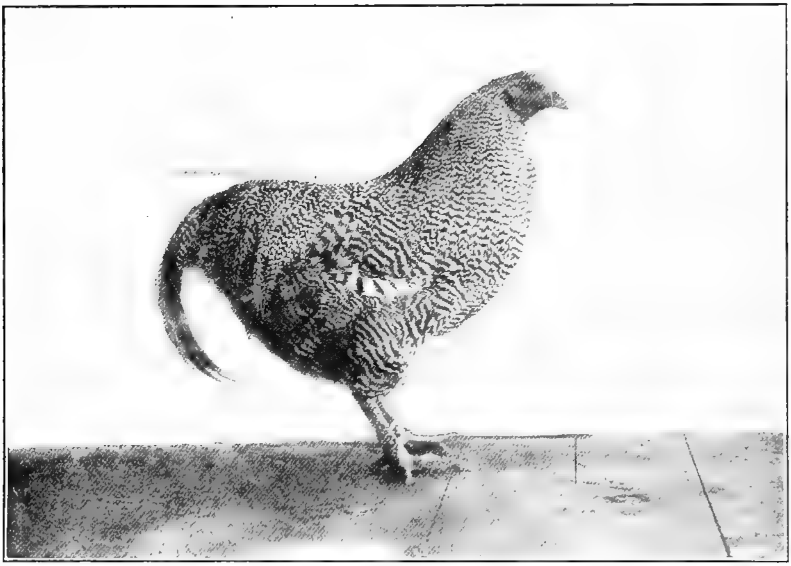
In view of these facts, the question naturally arises, "Why are there not more capons?" There are several reasons. A great many people do not know that there is such a thing as a capon. Still others consider the operation of caponizing either difficult or cruel, and refuse to attempt it. Probably the most common reason, however, is that very few people realize how much more profitable the capon is than the cockerel.

Capons are a rare thing on most farms, because the people who raise poultry have not realized what they are and the profits they bring. In some sections of many of the eastern states capons can be found on nearly every farm, and they bring the best prices of any fowl sold on the market. Some poultrymen claim the reason they are not raised generally is because there is no market for them. It is true, there is no market in some of the small towns and cities, but if they raise enough to make a shipment to any of the larger cities, they would be very readily sold and fancy prices paid for them by the best trade. There is no reason at all why the people shouldn't raise more capons than they do. Instead of having a lot of young cockerels running around loose on the farm eating more feed than they are worth, and always fighting each other, they could be caponized and be worth several times the value of a cockerel, and yet eat no more feed. Caponizing has been in practice for several centuries in foreign countries, but the people here seem to be very slow in taking hold of a good thing. Every year the farmer or poultryman loses money on his market cockerels, and there is only one good way to remedy this, and that is to caponize them. Cockerels at the age of two to four months will barely pay for themselves, and as they grow older they decrease in value and increase in expense. It is just the opposite with the capon.



A cockerel and his brother, a capon. They are quite different in shape, as you see above, due to one being caponized. The cockerel stands erect, has large wattles and comb, and carries a high tail. The capon is younger, but equals the cockerel in weight. He does not stand erect, has small wattles and comb and carries a low tail.

A capon is a male bird (cockerel) from which the testicles have been removed. He bears the same relation to a cockerel that a steer does to a bull. He has only one function in life, and that is to grow and get fat. He grows much faster, the comb and wattles cease to grow, his plumage is heavy and beautiful, he gets very lazy, and neither hen nor rooster have any more to do with him. Later on he becomes a very intimate friend of the little chickens and sometimes broods over them at night. If the poultryman expects to make the most out of his business, the capon is an absolute necessity. He makes quick, tender meat, much of it, and, best of all, he brings the highest price on the market. If properly dressed, he attracts the attention of the best buyers, to whom money is no object, if they can get what they want. To the great profit of the farmer, these epicures find what they want in the capon, and, best of all, he is sure money, quick money and easy money. Caponizing has at last solved the problem as to what to do with extra cockerels that are not needed for breeding.



A simple operation, quickly and easily performed, transferred this bird from the loss column and placed him in the profit column. Caponizing of at least a few cockerels should be practiced on every farm and in every poultry yard. The above capon is becoming filled and rounded out with layers of flesh and fat just as a fat steer would be. Whenever you are compelled to take less than 20 cents per pound for your cockerels you can afford to caponize them. Make certain that they are of the correct size. Avoid "slips" and "stags."

The operation of caponizing is so simple and easy that a ten-year-old child of ordinary intelligence can easily learn to perform it. With a little practice one becomes very skillful, and can caponize from twenty to forty cockerels per hour.

The cockerels should be caponized when they are quite small, not larger than quails. This is usually when they are from six to ten weeks old. At this time the testicles are about the size of a plump grain of wheat or perhaps as large as a bean. The loss of blood and shock of the operation is such that it is not advisable to caponize cockerels after they begin to crow and worry the hens. When performed on young two-months-old cockerels there is very little loss of blood, and practically no pain connected with the operation.

The method of operation can be learned from the printed instructions that accompany most all advertised instruments, but any one endeavoring to teach himself should operate on several dead cockerels before attempting live ones. If not done, death is almost sure to come to the first ones he operates on. If you follow the instructions given in this book you CANNOT FAIL.

A large number of people hesitate in caponizing, feeling it to be cruel to the bird. This is not true, because long experience has proven differently, and also the operator bestows an unlimited amount of kindness on the bird, even if there were not other considerations or returns. Most everyone who has had anything at all to do with poultry has seen cockerels fly at each other time after time, tearing flesh and feathers with beak and cutting with spurs. Before they could be separated there has been a disfigured comb, sometimes a blind eye, and generally a cut-up bird. This is the cruelty of the cockerel before he is caponized, but after being caponized his habits are entirely changed. His disposition is quiet and peaceful, habit mild and tending to a solitary life and satsfied wherever you put him.

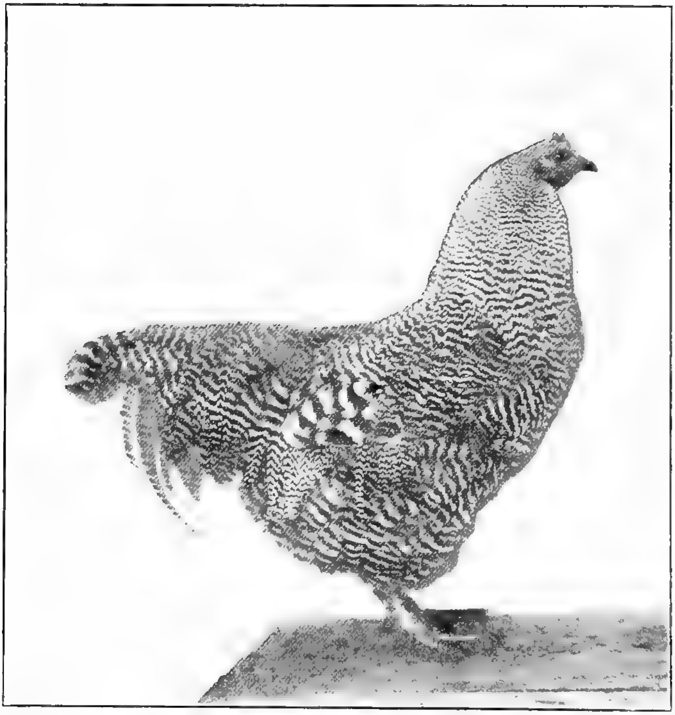
A S. C. Red capon, eight months old. Shows that he has a big frame and can be made to weigh 12 to 14 pounds very easily.

It is important to get good caponizing instruments. They will last a lifetime and save trouble. All capon tool manufacturers send complete instructions for caponizing with their tools, and Mr. Beuoy has given instructions in detail in the following chapter, so that it is unnecessary to give detailed instructions here, because the operation varies with each set of tools.

If you get your cockerels in the right condition before you attempt to caponize them, the operation is half performed. Keep them confined to a coop which should be placed in a dark, cool room. Do not feed or allow them to have a drop of water for at least thirty-six hours before they are operated on. There will be little or no bleeding if this is done.

The first and most important thing, then, in caponizing is having the cockerels in shape to operate on. From twenty-four to thirty-six hours before performing the operation, select the cockerels you intend to caponize, confining them in a clean, dry room or pen, without water or food. To do this with the best results, confine them early in the morning, and in the afternoon of the next day they will be in excellent condition to perform the operation upon.

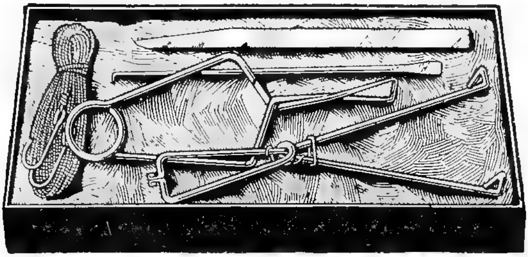
Both testicles can be removed from the same side, but for beginners two incisions are the best, being less difficult and not as dangerous to the fowl. Some caponizers, who claim to be authority on caponizing, say that two incisions are the safest for any one, professional or amateur, and almost the same rapidity can be made. Also, the birds will recover as soon from two cuts as from one. If both testicles are taken out of the same incision, the lower one should be taken out first because the blood runs down, and if the top one is taken out first, the blood would cover up the lower one and you would be unable to see it.



This shows the outline of a cockerel just back of a capon. The cockerel is raised some higher than the capon so he may be more easily seen. You can easily see the difference in carriage. The comb and wattles on the capon have never developed and he has a small head. The cockerel's comb, wattles and head are larger.

After caponizing the capons should be kept in a clean, quiet, cool pen for a week, until the wounds have time to heal. During this time they should be given soft feed and water. Don't feed too freely immediately following the operation. It is a good plan to examine them two or three days after the operation for "wind puffs" which sometimes form under the skin. These can be reduced by puncturing one side of the swelling with a sharp darning needle or penknife. After a week they can be turned out with the rest of the flock.

Keep the capons growing nicely until about three weeks before marketing, when they should be penned and fattened. Seventy pounds of corn meal, thirty pounds low grade flour, twenty pounds dry beef scraps and ten pounds of wheat bran make an excellent fattening food. Mix about two pounds of buttermilk or sour milk with each pound of the above mash mixture, and feed all they will clean up in twenty or thirty minutes. Feed this twice a day. Also give them all the grit and charcoal they will eat. Corn meal made sloppy with buttermilk or sour milk makes a splendid fattening ration.



Automatic and Safe Capon Tools, Ready for Use.

In dressing capons for market never cut off the head, as the head with the undeveloped comb is the feature that proves to the city buyer that the birds marketed really are capons. In picking it is usually customary to leave the head and hackle feathers on, feathers on the wings to the second joint, the tail feathers including those a little way up the back and the feathers on the legs half way up the thighs.

Most poultry raisers will probably prefer to sell their capons alive rather than dressed. Since marketing the capons is a new departure in many sections, some difficulty may be experienced in getting the local

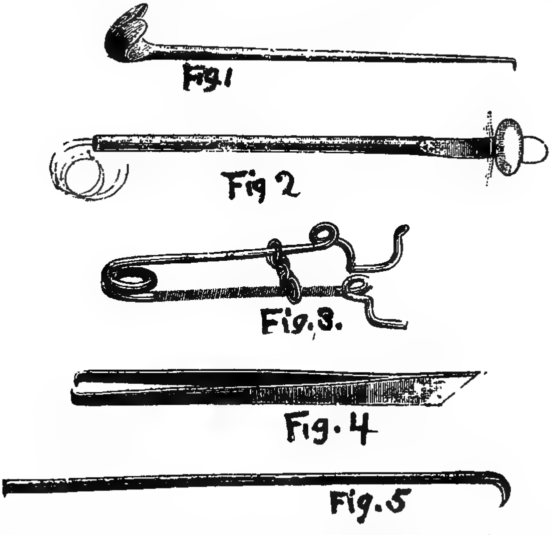


Fig 1

Fig 2

Fig. 3.

Fig. 4

Fig. 5

The old style capon tools which have been replaced by safer, saner and better tools. Fig. 1 is the twisting spoon. Fig. 2 is the canula used for separating the testicle from the bird's body. This instrument is threaded with a fine wire. Fig. 3 is the spreader. Fig. 4 is the knife and tweezers combined. Fig. 5 is the hook for picking the tissues. These tools are more or less out of date and we do not recommend them.

buyers to quote a special price on them. Most of them, however, will be glad to do so.

In making capons profitable the five most essential things which you must keep in mind are as follows:

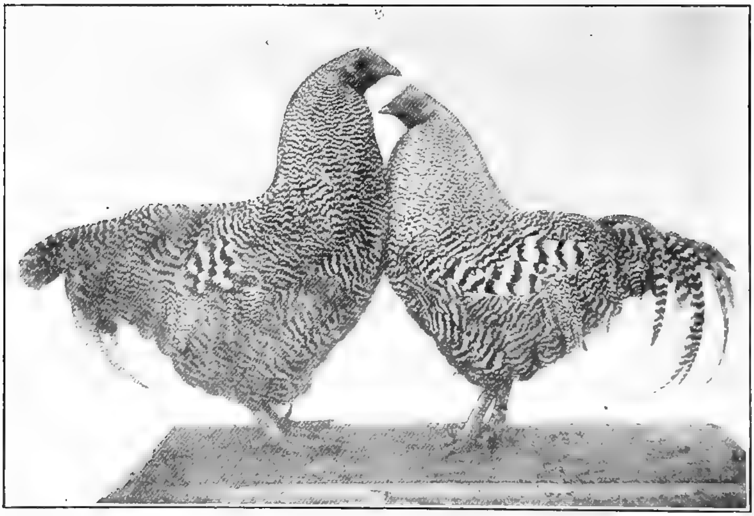
1. The most important thing is to see that the birds are in proper condition before being caponized. They must be kept in a cool, dark place, without feed or water, for at least thirty-six hours before caponizing.

2. Caponize when the birds are ripe—just before the comb shows much sign of development. In most varieties this is just about the time you can begin to tell the cockerels from the pullets. It is better to have them too small than too large.

3. Good instruments are a necessity. You cannot prevent death and "slips" without them. If you want the best tools write us and we will tell you the kind to get and where to get them.

4. Operate from both sides. Make incision and remove the organ next to you, then turn the bird over and repeat the operation. This method is best for amateurs. Operate on two or three dead cockerels which you have killed for frying until you can readily locate the organs and become familiar with the operation.

5. Cockerels should be marketed as broilers or fryers, or else caponized. As a general rule, cockerels which cannot be profitably marketed at a weight of two pounds or less by July 1st should be caponized. Don't market capons and "slips" in the same crate. Fatten them before marketing.



A pair of capons whose flesh is as tender as that of a broiler and as juicy and sweet as that of a pullet

Capons bring the highest prices from January to May each year. The larger the capons the higher the price per pound. For this reason it rarely pays to market capons before they are eight to twelve months old. Naturally the larger breeds, such as the Brahmas, Orpingtons, Plymouth Rocks, Langshans, Reds, Wyandottes, and similar varieties, make the best capons.

Quality counts in capons as well as in all other animals. Pure bred fowls show up their quality, run much more even in all market requirements than common or mixed breeds, and, therefore, it is very desirable to use Standard or pure bred fowls for capons. You can make capons from any kind of fowls, no matter what breed you have, and you can do it any month of the year provided the birds are right as to development. Sold as capons they will bring you three or four times as much as if sold on the market in any other way. Half the chicks hatched each year are males. It seems to me that about the only way to realize a profit from this half of your flock is to make capons of them. Especially is this true of the late spring, summer and fall hatched ones.

We do not wish to leave the impression that caponizing is any get-rich-quick scheme. We do believe it is profitable to caponize your cockerels if you cannot market them at profitable prices as broilers. Study your markets and be governed somewhat by them as to the extent to which you go in the number of fowls caponized. You can usually afford to caponize them if the price is lower than twenty cents per pound for broilers.

WIND PUFFS

In regard to Wind Puffs, I find that a considerable proportion of new beginners are bothered by having some of their birds develop Wind Puffs. Especially is this true when they work on only eight or ten birds as a starter. If they would work on fifty or a hundred birds at one time they would get the necessary practice and the Wind Puff problem would not bother them so much.

The condition of the bird has a lot to do with the Wind Puffs. Most people select runts and culls for this purpose and as you know these birds are not usually in the best condition.

The best method we have found to prevent Wind Puffs is to take a long stitch through the puffed part with common sewing thread, No. 40 or 50 white cotton. If the stitch holes are drawn out so that the two points where the thread passes through meet, and the thread tied in a tight knot so as to keep the two openings stretched somewhat, the air will escape and the puffs will go down. The needle holes will then pucker shut. In case the air puff should start to form again the stretched skin will permit the holes to open again automatically. If correctly done you see it would be impossible for the birds to puff at all.

The success of this treatment depends on the long stitch through the puffed part and drawing the two needle holes together and to tie tightly. This should not be done unless the bird is puffed, but if it is done right it cannot fail to work.

I believe that most cases of wind puffs can be eliminated if the operator will keep his instruments in a pan of water which contains some good disinfectant. The knife, the spreader, the remover and all other instruments used should be dropped into the water containing the disinfectant between each operation. That seems to prevent practically all cases of wind puffs. This method of prevention of wind puffs is worth far more than the cure, and I recommend it to all of our students.

WHAT'S A CAPON AND WHY?

By George Beuoy, Cedar Vale, Kansas. The Capon King.

A capon is an unsexed male bird. They are not hatched that way. To become a capon a young bird must be operated on in much the same manner as any other animal intended for eating purposes. The operation correctly performed, the capon grows to nearly twice the size he would, had he been left entire. His flesh is the juciest, sweetest and most tender of any known meat, selling for much more per pound than any other kind of fowl. In fact, the capon has become a modern necessity. Formerly capon was the most expensive luxury to be had. Capon in the olden times was the crowning event in the feast of the ancient kings and queens. Capons are still the greatest delicacy that can be placed before the particular epicure. Their rich, wholesome, tender flesh contains the life-giving, brain-forming, strength-producing food that is required by the high strung workingman of modern times, be his work indoors or out.

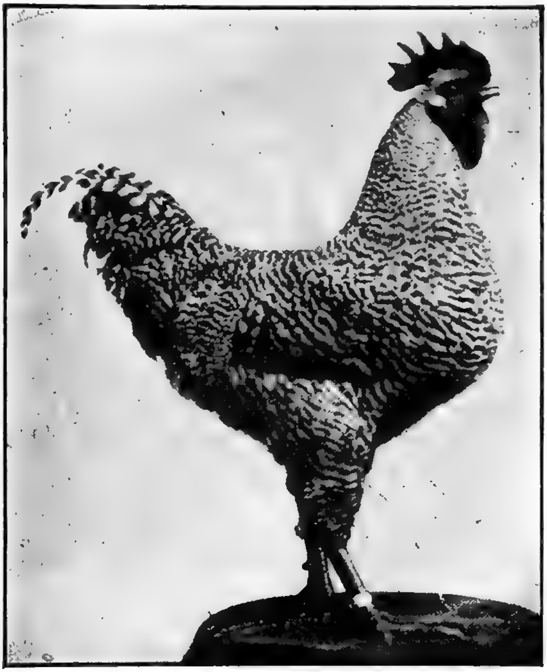
GEORGE BEUOY. MRS. GEORGE BEUOY.

The People Who Put "Cap" in Capon.

Up to the present time "Capons" have been enjoyed only by the wealthy and well-to-do classes, with the possible exception, perhaps, of a very few expert poultrymen who had mastered the art and learned to perform the operation with the old style tools. Modern invention and ingenuity have placed the capon within the reach of everyone with energy and ambition enough to feed and care for a chicken. In order to have some capons, all that is necessary is to remove the young cockerel's reproducing organs. These organs are not exposed on the outside of the body as they are in the larger animals, but are carried on the inside. You will find them just under the backbone, one on each side, and in line between the last two ribs.

In order to remove these organs it is absolutely necessary to use some kind of instrument. The success of the operation will depend upon the character of the tools used.

It is a fact that capons should be found in every section where chickens are raised the world over. Yet there are a great many people in America who have never heard of a capon. Surely there must be some good reason why poultry raisers have not made some capons. By all the laws of common sense they should be as popular in the poultry yards as steers are in the cattle lots. The demand for capons is just as great as it is for steers. Capons command much the higher price per pound on the open market, and the supply has never as yet been sufficient to meet the requirements. Why, then, has not caponizing become more general? Simply, because, with the old style tools there were too many "slips." Very few birds are killed, or even hurt, by the operation, unless you attempt to use some sort of sharp-edged clipping testicle remover, which is very dangerous. The real discouraging feature heretofore has been due to the large amount of "slips" that would develop from each bunch operated on.



A "Slip." Note the slim body, heavy comb and "clecky" appearance not found in the capon.

A "slip" is no good. He is the scoundrel that has kept the profitable, kind-hearted capon from becoming the most popular bird that the world has ever known. The slip himself cannot be personally blamed for this. The fact is, he no doubt would much prefer to be a capon and in due time enter into his proper place in high society. The slip, however, has to be content with a place midway between the capon and the old rooster, bringing on the market a few cents per pound more than his daddy, the old rooster, and much less than his kind-hearted brother, the capon. A "slip" is caused by an imperfect operation, due principally to a wrongly constructed tool. In making a capon the parts to be removed are very soft and tender, almost like jelly, and attached to the bird with cords and membranes, much the same as in the other animals, except that the organs are inside the bird's body. The nature of the fowl is such that the smallest particle of these organs, cords or adhering membranes left in the bird will result in nature trying to grow a new organ. With the old style tools it is almost impossible to remove them entire. In fifty to sixty per cent of the cases enough is usually left to cause nature to try to replace them, resulting in the discouraging, unprofitable "slip." Hence the shortage in the world's supply of capons. Of course there are some exceptions; certain sections of the country near the large critical markets, where capons command forty to fifty cents per pound, have stuck to the problem on account of the unusual large profits that were to be made from capons. Certain individuals, after much practice and many expensive experiences, have mastered the art with the old style tools, until they are able to get a fairly large per cent of capons.

A poor type S. C. Red Capon and a good type Barred Plymouth Rock. It pays to breed for shape. Any of the general purpose or meat breeds make very fine capons. The type is controlled largely by selection and breeding.

These men have made a business of caponizing for the community, charging from five to fifteen cents per bird operated on for their services. Wherever one of these experts is available the capon industry has developed into large proportions.

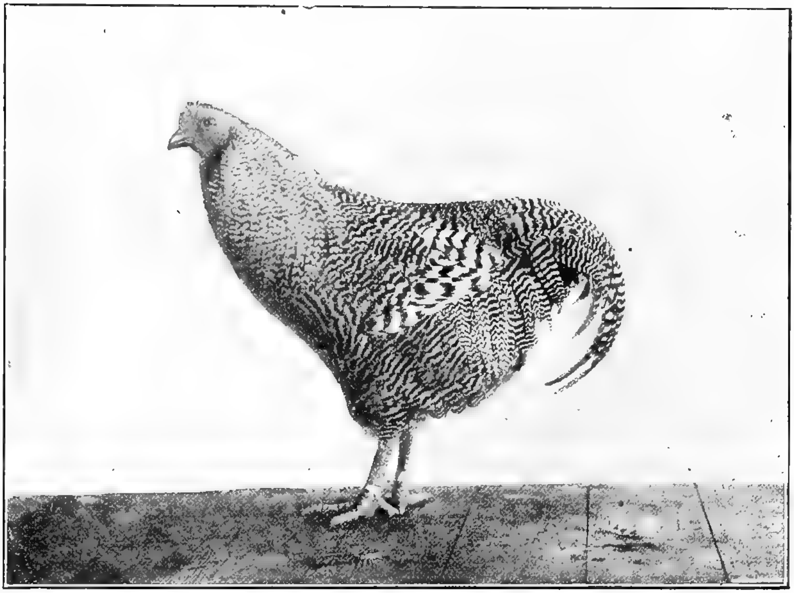
In summing up the facts it at once becomes apparent that capons are very profitable, and much to be desired. The real reason they are not more generally found in this country is the lack of a set of instruments that the ordinary person can use successfully without special training.

Such tools have now been perfected and patented. I have personally tried out these tools and know that they are all that is claimed for them. These tools were originally invented and patents obtained or applied for by myself. These tools work practically automatically and very little skill is required to make a capon with them. Rightly used a "slip" is impossible. Once tried you will never be without capons—they are the greatest eating to be had. That is what we have always thought, but after we had the pleasure of reading the following letter we know it to be a fact. Surely no higher authority than the president of the American Poultry Association need be cited on this point:

Kansas City, Mo., December 24, 1920.

Mr. George Beuoy, Cedar Vale, Kan.

Dear Mr. Beuoy:—I cannot begin to express the thanks of myself and family for the magnificent capon you sent us. He arrived in the afternoon and when I got home I found my little boys had him out playing with him and they thought that he was about big enough to make a horse. I have to leave this afternoon, and I just could not bear the thought of leaving without tasting some of that juicy bird. So last night I killed and dressed him and today we had him good and brown. Now I am not flattering you when I say that I have eaten pheasant, ducks, geese and chickens cooked by some of the most expert chefs in America, but I never ate anything equal to that capon. I really dread to leave home this afternoon, for two reasons: First, I fear the entire family have eaten so much capon that they will likely get down. Second, I would like to be here for another fine



A capon about half grown, but showing vigor, style, shape and beauty.

Twelve Pound White Rock Capon.

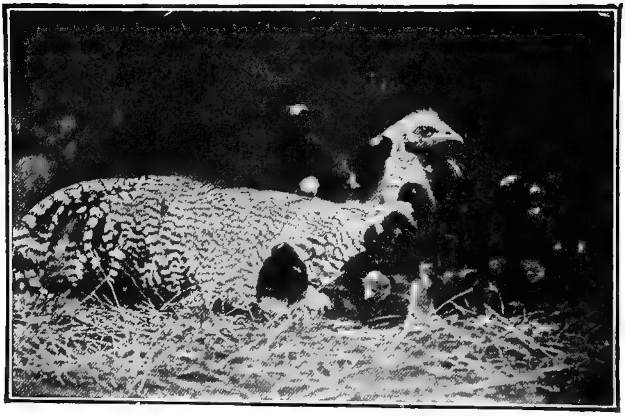
lunch off that capon served cold. There were twelve of us at a magnificent meal today. Now, this counting in my family and visitors that we invited in to partake of the feast and still there was some to spare. We did not quite get twelve baskets full of fragments, but they have plenty left for supper and I am going away in a short time and will miss finishing the treat. You know how the women appreciate something nice for the table; well, my wife was certainly happy to get that fine capon, and she joins me in expressing our thanks. Mr. Beuoy, I do not know how I can ever pay you for your kindness in this matter, and I hope when I see you at Wichita (at the State Poultry Show) I will be able to make good with you in some way to show you that I appreciate your kindness far more than this letter begins to express.

Wishing you a merry Xmas and a happy New Year, I am,

Cordially yours, REESE V. HICKS.

The above letter was written by Mr. Hicks (at that time president of the American Poultry Association and editor-in-chief of Poultry Culture.) President Hicks voices the sentiments of every one who has tried capons. They are undoubtedly the best eating to be had.

CAPONS AS FOSTER MOTHERS.

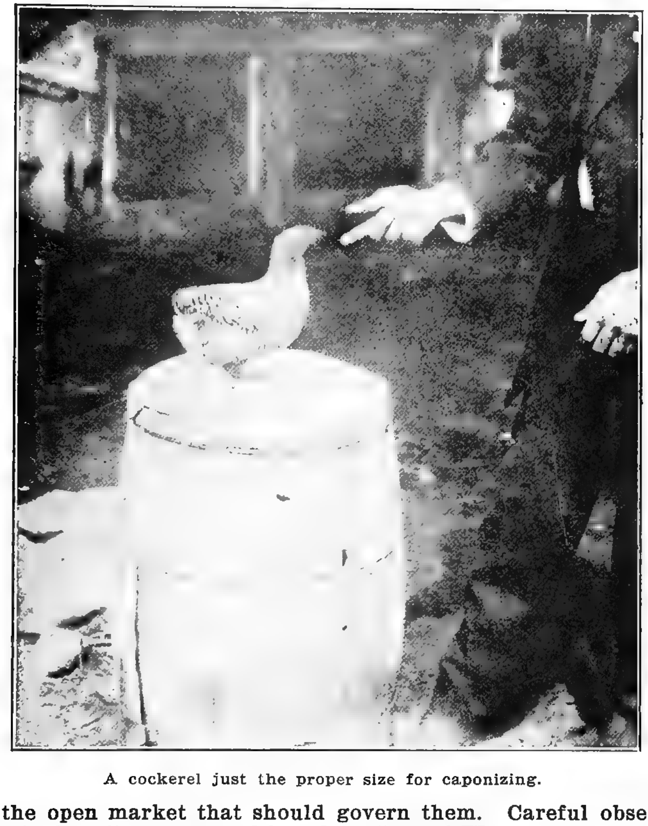


Real photograph, without retouching in any way. Capons can be used as a means of raising little chicks. On our large experiment farm we have raised from five to six hundred chicks every year for the last five years. These were hatched in incubators and given to capons to raise. They were taken right from the machine and given to the capons. The capons have raised to maturity over 85 per cent of all chicks given to them, a feat that would hardly be possible with any style of brooder. A capon will cluck and hover the little chicks exactly the same as a hen. It requires very little training to have them do this.

(While capons can be taught to brood chicks, yet we do not recommend this practice, as a rule, with very young chicks. When you do find one so inclined, they make good mothers, but we prefer to trust a good brooder or hover in preference.—T. E. Q.)

THE REASON FOR HIGH PRICES FOR CAPONS

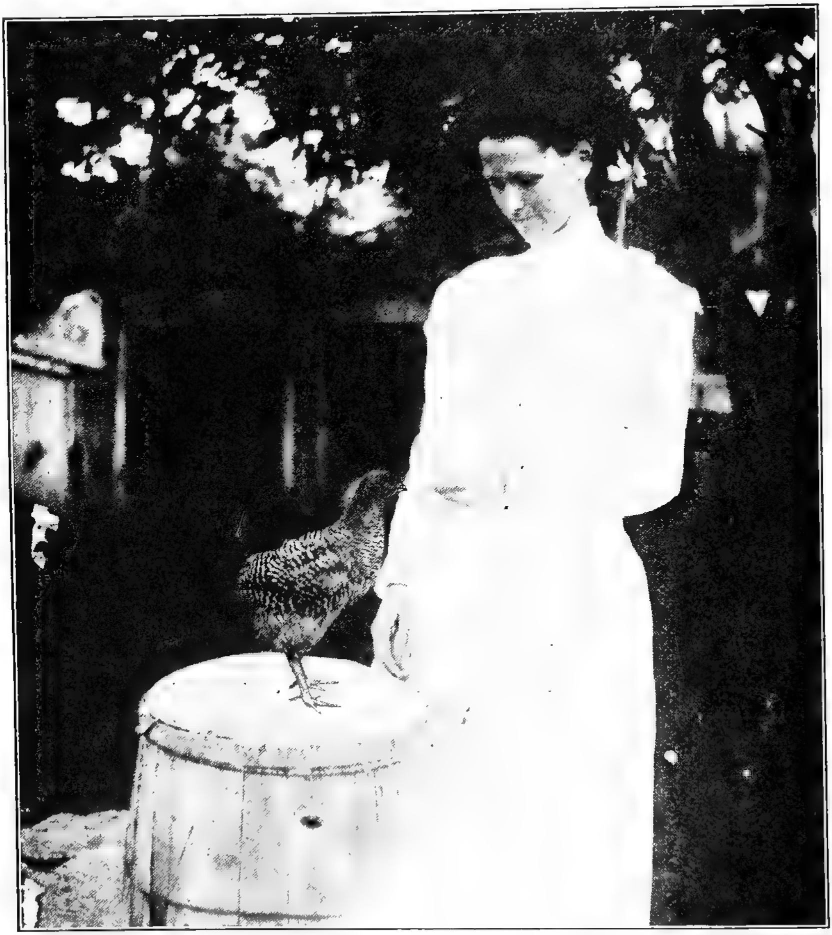
Capons bring high prices; there will always be a demand for them far in excess of the supply. Some makers of capon instruments have enlarged on the prices obtainable for capons and overstated the facts. There is no doubt but that forty to fifty cents per pound can be obtained in certain aristocratic sections for dressed capon in fancy style. However, that is not what interests the average producer. It is the price readily obtainable on the open market that should govern them. Careful observations covering the last five years and based on Central Western conditions show that the average price in season for capons to be right around twenty cents per pound; in some instances as low as fifteen cents per pound, live weight. Farther West, where capons are better known, the price was much better.



A cockerel just the proper size for caponizing.

It is not a question of how much you can get for the capon; the point is you cannot afford to be without capons, even though you never intend to sell one. One capon will more than pay for a set of tools that will last forever. As a source of food supply they cannot be ignored. With a good set of instruments in your possession you at once have unlimited access to the greatest table delicacy obtainable in ancient or modern times, a so-called luxury that was out of the reach of the poor man and not always obtainable by the rich. Modern down-to-date invention, together with a little "gumption" on the part of the consumer, has placed this dish within the reach of all. As a source of profit no other part of the poultry business offers so great a return as capons. It is safe to figure that they will always bring twice as much per pound as hens. They will average about twice as heavy, just as the finished steer will outweigh and outsell the cow.

As a means of recreation, "caponizing" presents a subject full of interest and running over with possibilities. Bankers, teachers, clerks and business men in all lines of work get great enjoyment from a few capons. The operation is very interesting, requiring a certain amount of skill, but it is soon learned and easily performed. After the operation comes the pleasure of watching the capons grow and develop. Later there is the pleasure of feasting on their sweet juicy flesh. In addition there is the satisfying knowledge that the bird is pure and wholesome, and in the proper condition.



This photo shows a Barred Rock cockerel "just right to caponize."

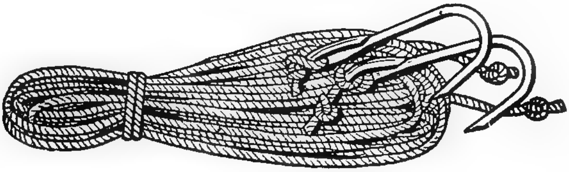
Children especially take great interest in the operation and in watching the birds develop. Boys or girls of over ten years of age are quick to get the hang of the operation and soon become expert at it. Note the picture of little ten-year-old Helen Beuoy. Helen learned the operation herself, practicing first on a dead bird, one that had just been killed to eat. During the season just passed Helen worked on many birds, and quit the season without the loss of a single one. The picture is from an actual photo without retouching in any way, and was taken by Ocie Sartin while Helen was operating on a live bird. At the time the picture was taken Helen was only ten years old.

IF A CHILD CAN DO IT, SO CAN YOU.

Little Helen Beuoy, Cedar Vale, Kansas, making a capon. At the time this picture was taken Helen was only ten years old. This little girl makes spending money by working birds for the neighbors. She gets ten cents for each capon she makes. It is easy for her to operate on fifty birds in one afternoon.

There are several good reasons why capons bring such high prices, the principal one being that capons hit the market at a time when all other poultry is very scare and hard to get at any price. A capon gets his growth usually during February or March and is ready for the market at that time. That is too early in the season for young chicks or broilers and those who have wintered a bunch of hens do not care to sell at this time because the hens are laying their best and eggs are at the top price at this season. There are no grass cattle on the market, which means that beef, pork and all kinds of meat, in fact, is not only scarce and high but in many instances cannot be had at all. The capon is at his best at this time and comes in at exactly the proper time to fill a longfelt want and to supply the market with the best possible quality of meat.

At least half the chickens hatched each year are male birds. Early hatched birds are of course the most profitable. As this is a well known fact, the result is that the bulk of the chicken crop is hatched during March, April and May. This means that the young males, or at least half of all the chickens raised, will be ready for market at or about the same time.



Hooks and cords for fastening the fowl during the operation. The hooks are for fastening the cords about the fowl's legs and wings and save tying a knot each time.

Under old methods this half of the poultry crop of this country would reach the market as frying chickens or broilers and all in a bunch, or nearly so. Under the best conditions they would all come onto the market within ninety days and during the hottest time of the season. This means that the market would become glutted and no demand. The price would have to sink to its lowest ebb and the birds sold for less than it cost to raise them.

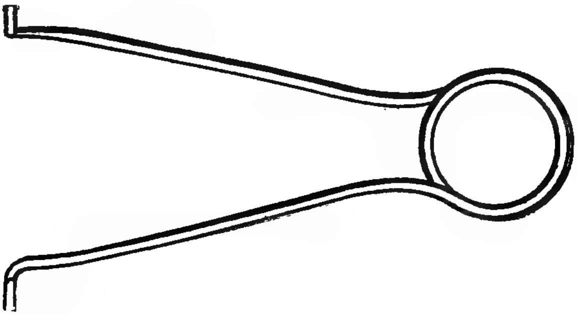
Modern conditions demand modern methods, and it is only by caponizing the young males that this valuable source of wholesome food can be conserved and distributed over the entire year instead of being rushed to the market in a bunch.

Five or six years ago we began to caponize all of our surplus male birds and since then the capons have been the most profitable part of our poultry business. As a matter of fact up to that time we had lost money on the male half of our flock; now they make us more profit than the hens or pullets. We sell them right on the market and what we have done and are still doing, any farmer or poultry raiser can do equally as well.

Operating knife for separating the ribs and removing the testicles. Also an excellent knife for killing all kinds of poultry for market.

It will be only a very short time until capons will be found on every farm in the country; the signs of the times point that way and the issue cannot be dodged. Capons are bound to come. Conditions demand that the male bird be caponized in order to protect the egg crop, if for no other reason. We are told, and most of us know it to be a fact, that unfertilized eggs can be kept in a perfectly fresh condition for many months. It is also an established fact that unfertilized eggs will sell for double the price of eggs that are fertilized. The problem with the farmer who produces the bulk of the egg crop has been to find a practical way of disposing of the males. Forced on the market during the hot months they were sure to produce a loss. Under the old method, it was almost impossible for the average farmer to make capons with any degree of success. Necessity, as usual, is the mother of invention and these new conditions demanded a modern way of making capons, one that would be safe, sure and effective. I have met all these conditions in the Capon Tools invented and patented by me some two years ago. I have been using a set of these tools ever since they were first invented, caponizing several hundred birds each year with the very best success. I have a little boy only seven years old who can do the work just as well and almost as fast as myself. There is scarcely any danger from the operation if the proper instruments are used. Best results can be secured if the birds are worked on when quite small. In the American breeds when they are about like quails in size and appearance is the best time. In the small breeds, like Leghorns, they will have to be worked even smaller than that on account of the fact that birds of small breeds develop much faster sexually than the larger breeds. The idea is to get them just before the comb and wattles begin to grow or redden.

It is much easier and faster to do this work on poultry than it is to perform a similar operation on any other kind of stock or animal. The danger to the fowl is not so great and the bird will recover from the operation much quicker than a pig or calf. With a little practice any one can soon learn to make thirty or forty capons in an hour. As a starter it is best to practice on a dead bird. Commence on one that you have just killed to eat, work on one or two in that way and you will become accustomed to the instruments and will get the parts to be removed fixed in your mind. You will then be anxious to try on a live bird and can proceed with confidence and success. It pays to take plenty of time at the start and go slowly on the first few. In case one should be killed it would just bleed to death and would die much quicker than if its head were cut off in the usual way and of course would be just as good to eat.



Common spring spreader. Adjusted to spread birds of one pound and a half to two pounds in weight. Can be regulated as to strength by bending the arms of the spring to suit.

Capons are profit makers and they bring in the cash at a time of the year when we need it most. Usually February and March are dull months on the farm. Have a flock of capons and cash in at this time. It helps.

I remember my first bunch of capons and the nice profit they made me. It was some five or six years ago. Along in July we found that we had a few over a hundred young cockerels that we must dispose of. Inquiries as to market price developed the fact that we could not get over twenty cents a piece for them or a total of twenty dollars for the hundred birds. I had not at that time had any experience with capons. In fact, I had never even seen the operation performed, but I secured a set of the best instruments I could find and started in on them. At first it was a bit awkward, but a little practice and I was all right. We fattened that bunch of capons, sold them on the market in the latter part of February, shipping them to Kansas City and selling live weight on the market. As I remember it we received twenty-one cents per pound for them and they weighed a trifle over ten pounds each on the average, which made the hundred capons bring something over two hundred dollars. A gross profit of one hundred and eighty dollars more than they would have brought sold as cockerels. A net profit of at least one dollar each.

Usually capons will bring about double the price of hens per pound. It costs about the same to raise a capon as a hen. The capon will weigh at least twice as much and as he sells higher per pound a good capon will bring about the same amount of money as four hens of the same breed.

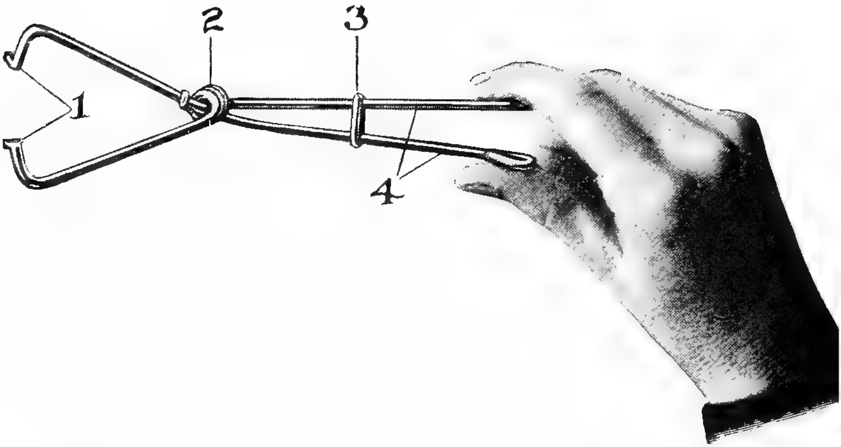
Aside from the capon's value as a strictly money making farm issue he has other qualities that should commend him to your attention. Capons make fine mothers for the newly hatched chicks. In connection with an incubator they are the best means of raising little chicks that we have ever tried. You understand of course that "capons do not lay eggs," and it is no use to write me for "capon eggs." But they do love to look after a bunch of little chicks. They will hover them and cluck to them exactly like a mother hen and in most cases are better with the little fellows than the best of hens. It is no trouble to teach them to do this, they just naturally take to little chicks, like a small boy to a mud hole. A few years ago capons were scarcely known in this section, now they are becoming quite common. Following my success with capons on the market I was requested to give a lecture and demonstration at our Agricultural College at Manhattan in connection with the annual field meeting of the Kansas State Poultry Federation. This feature was so much of a success and so much interest and enthusiasm was shown that I was engaged by the Missouri State Poultry Board last summer to attend a series of field meetings in that state and lecture and demonstrate the art of caponizing. I was in Missouri some two weeks and gave lectures at nine towns in the principal poultry sections, including one day at their State Poultry Experiment Station at Mountain Grove. The trip was under the management and guidance of T. E. Quisenberry, director of the Missouri State Poultry Station, and everywhere we met with the greatest interest by crowds which varied from two to five thousand people. I have also within the last few months given lectuers and demonstrations in many Kansas towns and a few in Oklahoma, in many instances at the expense and request of the Farmers' Institutes, and I can say to you that the farmer who does not caponize his male birds the coming season is entirely behind the times and will lose a nice profit to which he is fully entitled and should have. That farmers in Missouri are awake to the possibilities of capons, is proven, I think, by the fact that they have insisted that demonstrations and lectures on capons be included at all field meetings in that state this season.

Make a few capons this season, even if you don't intend to sell one. Make a few for your own use, it will pay big just for that alone.

I do a lot of lecture and demonstration work on this subject, not because I want to, but because I cannot get out of it and do my duty to the industry. Honestly, I don't believe it helps the beginner to have some one show him or her how to caponize. I believe you can learn better and quicker by commencing on a dead bird as stated above and learning by yourself. Too much advice is bad dope—just get out by yourself without any one to bother and you will be surprised how easy and simple it really is.

PREPARING TO CAPONIZE

The first thing necessary, of course, is a bird of the right degree of development and in the proper condition. The right stage of development is as important as the condition, and either of these two points not correct will cause a large per cent of failures. Many people ask how old the birds should be, or how much they should weigh, when they are right to caponize. How old they should be or how large they are is "wide of the mark," what they really should know is the proper state of development. This stage of the bird's growth is hard to explain so that all will understand it alike. Different breeds and different flocks of the same breed vary as to the time and manner of their development. No set rules can be given that would be just right in every instance. The proper time to caponize is "just before the bird reaches the sexual maturity." Generally speaking, when the birds reach one pound and a half to two pounds in weight. Leghorns and all small breeds should be worked on smaller even than that, as they develop the generative organs much sooner than the larger breeds. All fowls of early spring hatches develop sexually much sooner than those of summer or fall hatches. For that reason the early hatched ones cannot be let run so long as the later hatched birds. It always sounds "bad" to try to explain the proper time to caponize on paper, yet a very little practice will show you when they are just right. Once you get the right idea, it will be easy to tell the ones that are "just right" by the looks of the fowl. The main thing is to start, "get at it," the rest will come to you all right. A little practice and you are an expert. You will find the ones that are just right in a variety of different sizes and ages. The essential requirement is to have the testicle and its attachments in just the right state of development.

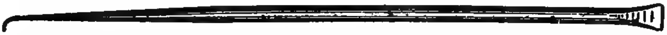


Humane spreader. This picture shows the tool open. You have plenty of room to work between the arm marked No. 1. The compound spring hinge, marked No. 2, closes the spreader automatically and presents a yielding force that is humane in its action.

These organs should be just about the size of a common navy bean; in no case larger, and slightly smaller preferred. After you are in practice, the work may be done where the testicles are no larger than plump grains of wheat. They should be about the same shape and color as a nice bright plump grain of soft winter wheat. The expert will get the best possible results where the organs are in the stage of development. The organs should be a little larger for the beginner as they can be seen to better advantage. With old-fashioned, clumsy tools, it was, of course, impossible to do the work where the organs were so small. There was not room enough inside the bird to use the old tools. With the modern automatic tools, it is possible and much better to operate on small birds.

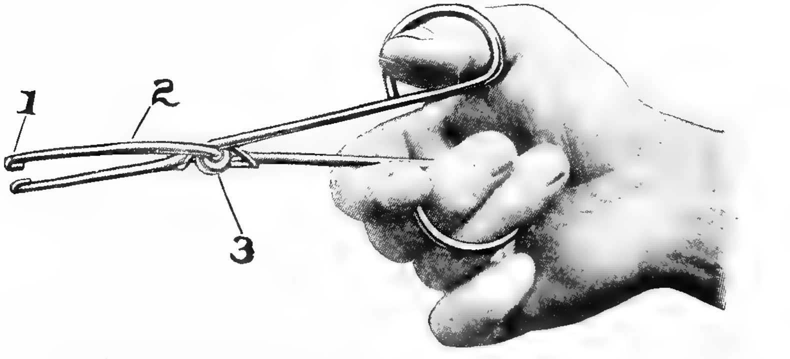
WHAT IS A "SLIP"?

Not having the bird "just right" has caused many failures. I should say that there is about three weeks in the life of each male bird when he is just right to caponize. Before that period he is too small, and afterward, too much developed. Of course, it is understood that the operation can be and is performed on birds of all sizes and ages with success, in so far as the operation is concerned. A fowl that is fully developed, sexually, at the time he is caponized, never becomes a capon. He is simply a "stag," the same as where a bull or a boar is operated on. He will only sell as a "stag." A bird of this kind is called a "slip." In reality he is a "stag" or proud male. After a cockerel begins to crow and his head and comb reddens he is too far advanced to ever make a capon. They must be worked on before they get that far along, if good results are to be expected.



Combination hook and probe. The sharp hook end is for making the opening in the tissue covering the intestines so that the testicles may be plainly seen. The flat probe end is for pushing the intestines back in case it is necessary so as to have a clear view of the work to be done. This is a mighty handy instrument to use in dressing any kind of a wound. Cotton may be wrapped about the hook end for wiping up blood or for cleaning an old sore. Farmers will find this instrument especially useful in removing screw worms from barb wire cuts.

Next to having the birds in the right stage of development comes the condition. It is possible for the expert to operate on them in most any kind of condition. Yet it is very poor judgment for him to attempt it unless they are right. The birds should be growing and in a thriving state of health. As the organs to be removed are inside the birds, it will be easy to understand that if the bird is full of feed, his inside fixings will be puffed up and expanded, taking up all the room and shutting out the light so that the organ to be removed cannot be found or removed for lack of room. For this reason, "it is very important" that the birds to be caponized be confined to a small yard or coop and not allowed anything to eat for at least thirty-six hours, just before the operation is to be performed. It takes nature about that long to exhaust the food supply that the bird usually has on hand.

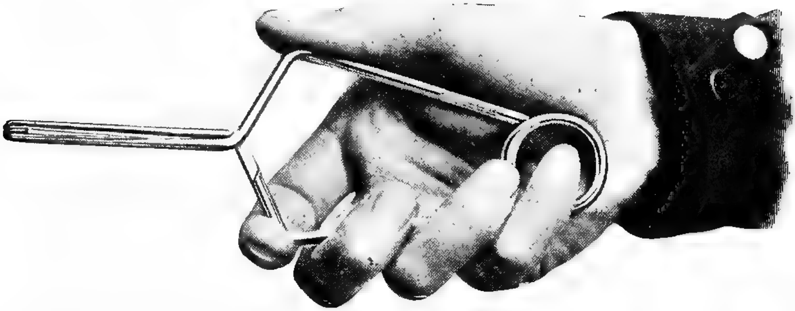


Beuoy's New Model Remover, open ready for business. The compound spring hinge shuts the tool automatically and holds it securely closed. The loops, marked No. 1, and the arms, marked No. 2, are exactly the same as on the Automatic Remover and are covered by the same patents. The two removers are used much the same, the New Model, however, opens and closes like a pair of scissors or forceps, and is preferréd by some for that reason. It has no advanttage over the Automatic Remover.

Be sure they do not have anything to eat or drink. For the beginner a good light is necessary, right out in the sun will be best. You can see the inner works of the birds to perfection. The testicles occupy about the same position in a bird that the kidneys do in a hog or rabbit. There is no danger of getting the wrong organs, as the testicles are the only yellow colored objects you see in the bird. If the bird is in good health the testicles will be yellow and shaped like a grain of wheat, or slightly longer; the other parts of the bird are red, or nearly so. The testicles are always yellow or whitish yellow except in a deceased bird, when they sometimes become black or partly so.

THE PROPER TOOLS

After you have the birds just right, comes the tools. Success will depend on their construction and working principles as much as on the bird and its condition. With the proper tools and the birds right, any one can make a capon. Tools that work with a hair fine wire or that are constructed on the split-scoop principle and the ones that have clipping attachments are no good. A large per cent of loss by death and slips may be expected where they are used. The reason for this loss is clear, when it is understood that tools of the above character must come in actual contact with the testicle itself before the tool can be manipulated in an effective manner. This being the case, it, of course, follows that the testicle attachments must be severed right up against that organ. In many instances a small part of the testicle is left in the bird, resulting in a "slip" every time. Where that style of tools are used the cord membranes and attachments are all left in the bird. And these are very apt to produce a "'slip."



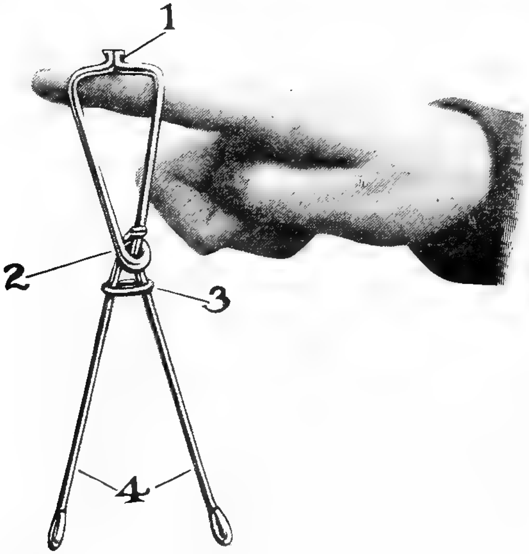
The latest remover. The business end of the remover consists of two loops, the lips of which are beveled outward like a dove's tail and fitted together like a split hair. The outward bevel prevents it grasping parts that are not wanted and the fine adjusted grip holds the parts to be removed absolutely secure.

A real successful testicle remover must be so constructed that it will open up wide enough to pass entirely over the testicle and grasp the cords and membranes that hold it in place. The tool must then retain that grasp without letting the slightest particle escape. As the testicle lies very close to the spermatic artery and is sometimes attached to it, any one will understand, "That any clipping contrivance with a sharp cutting edge" is apt to sever this artery, resulting in the death of the bird. The successful remover must be beveled outward like a dove's tail and fit at the connecting edges like a split hair. This will permit the grasping members being worked down between the spermatic artery and testicle without danger of injuring either.

The instrument then has a grasp on the connecting cords and membranes with the testicle inside its loop. So the cords and attachments may be gradually stretched out away from the artery and the bird's back, and cut off with a thin, sharp, narrow bladed knife. Handled in this way there is no danger of killing the bird. It does not seem to hurt them in the least at this time, and as the tool is turned over several times before cutting, the cords are twisted together like a string, thus stopping the blood, and the bird will not bleed at all if the operation is properly performed.

The cords, membranes and attachments are all taken out with the removers, as well as the testicles, so there cannot be any "slips" develop, because the operation is a clean one.

Next in importance to the testicle remover, comes the spreader, used for holding the ribs apart while the operation is performed. Almost any kind of spreader can be used with fair success. The most common kind in use hertofore is the ordinary spring spreader. It is made of spring wire and sells for twenty-five cents, or same can be made from an old piece of bed-spring. The trouble with this kind of spreader is that no two birds will present the same amount of resistance. The spring may be strong enough to break the ribs of one bird and not strong enough to open the next one. There is no way to regulate it. It is hard to insert into the bird and will not stay in place without some one to hold it. However, it can be used successfully, and has been for many years. Principally on account of its cheapness and the lack of anything better, the "Humane Spreader," one of the best things we have seen in the way of a spreader was invented.

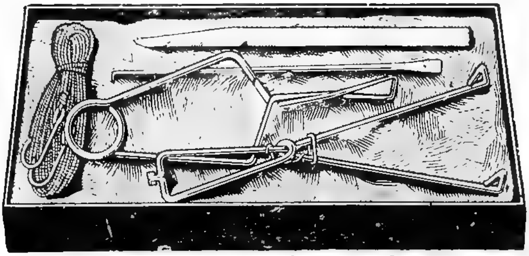


Humane Spreader. This is the instrument used to spread the last two ribs apart so that you can see to do the work. The flanges, marked No. 1, are inserted between the ribs, and the handles, marked No. 4, brought together. The link, marked No. 3, drops back by gravity and holds them spread at any desired width. The hinge, marked No. 2, fits up into the bird's flank and holds the tool steady.

The "Humane Spreader" is constructed to fit the bird's body. It is used from the same side that the operator works on. The coil spring hinge fits up in the bird's thigh, the handles resting on the operating table, thus holding it firmly in position. The spreader closes automatically, making it easy to insert between the ribs. To spread the cut, press the handles together with the thumb and fore-finger, the slide drops back by gravity as the two handles come together, holding the tool spread at any desired width, only pressure enough being used to open the ribs just right, so no unnecessary pain is caused the bird. A coil spring spreader keeps up a steady pressure on the bird all the time, resulting in much pain.

We like this spreader much the best of any we have ever used. It is very convenient, affords plenty of room to work, and has no complicated parts to get out of order. We have tried other spreaders, and most of them work all right, but we believe the "Humane Spreader" presents many advantages not found in any other spreader. The spreader is the tool that gives you the view of the work to be performed and, therefore, it is desirable that a good one be used. None of them are expensive, and we suggest that you use the best.

Aside from the testicle remover and spreader, the rest of the equipment is not so important. It will be necessary to have some kind of knife. It should have a small blade that will hold a thin sharp edge. You will have to have a tearing hook and probe. We like them combined, probe on one end and hook on the other. The hook is for tearing the thin membrane or tissue that covers the intestines and obstructs the view when the bird is first opened up with the spreaders. The tissue is too thin to be cut and must be torn; it is about like wet tissue paper. The probe is not used much, but once in a while it will come in handy to press the intestines back with, in case they are a little too full and obstruct the view.



A complete set of capon tools.

Some sort of operating table and means of fastening the birds will also be required. An empty barrel turned bottom side up makes a good table and is the right height. A brick broken in two and each half tied to a cord about three feet long, with a hook attached to the free end, makes a good way to fasten the bird. The hooks are to pass over the string when it is wound around the bird's legs or wings and save tying a knot each time.

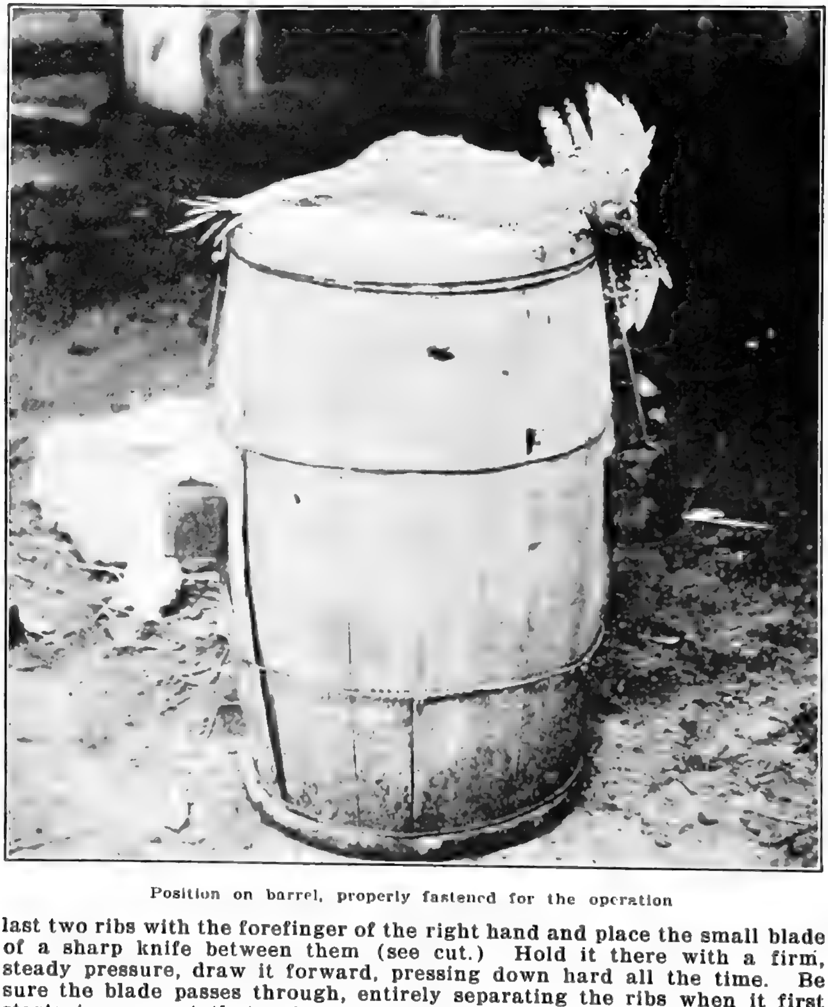
"PETE AND REPEAT."
Big Enough to Use for Pet Horses.

THE OPERATION.

Turn an empty barrel bottom side up to use for an operating table. It is the right height and can't be beat for the purpose. Secure two pieces of cord about three feet long with a hook in one end of each.

Tie a half brick to the other end of each cord and you are ready to proceed. Place the cockerel on the top of the barrel right side up. Wrap one of the cords twice around his legs and fasten with the hook. Wrap the other cord around his wings at second joint and fasten same as the other one, stretch him out on top of the barrel as far as possible, letting the weights hang down on each side of the barrel as shown in the cut.

Now pluck a few feathers from just in front of the hip joint. (These are just ready to moult, anyway, and will come out easily.) Stand on the front side of the bird so that the breast is toward you. Locate the last two ribs with the forefinger of the right hand and place the small blade of a sharp knife between them (see cut.) Hold it there with a firm, steady pressure, draw it forward, pressing down hard all the time. Be sure the blade passes through, entirely separating the ribs when it first starts to move at that point. Then make the cut about one inch long.

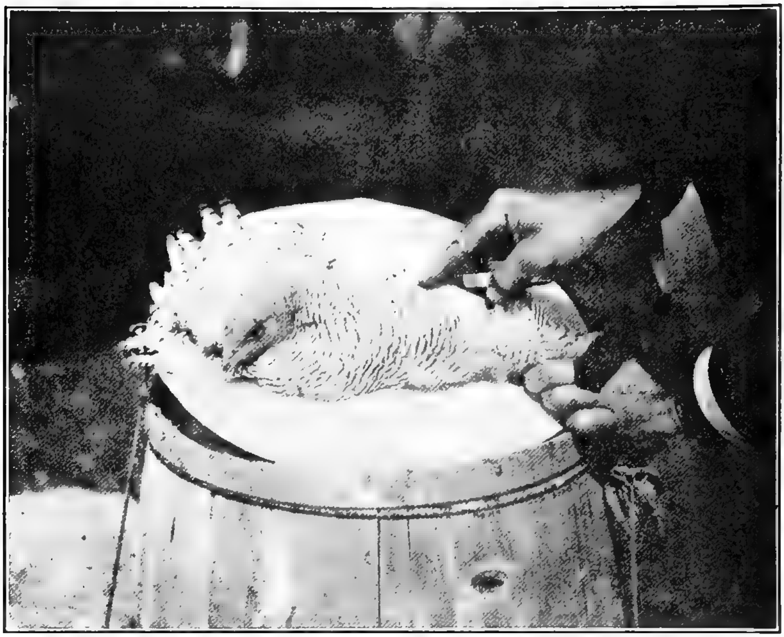


Position on barrel, properly fastened for the operation

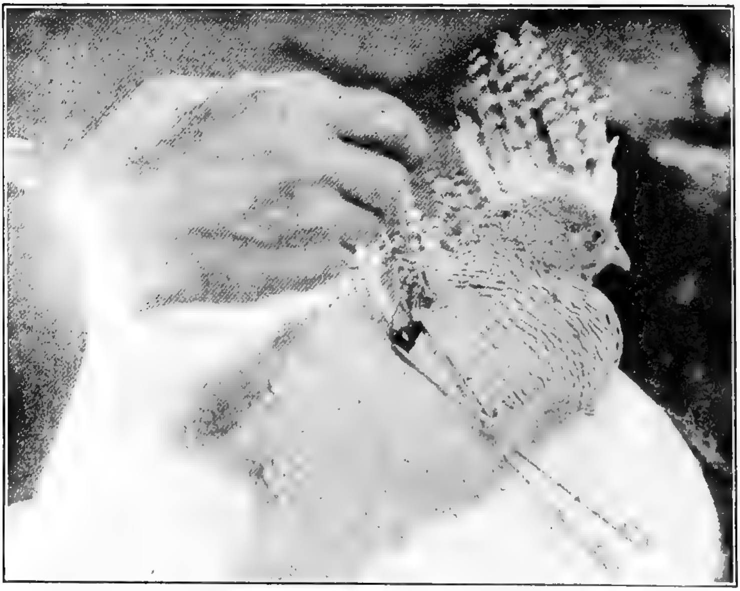
(See the illustration.) The idea is to separate the ribs without cutting any muscles and if the blade passes entirely through at the first attempt this will be accomplished and no bleeding will follow. It will be necessary to press down very hard on the knife as that is important. The pressure separates the ribs without cutting the muscles, thereby preventing any blood from flowing.

The cut made, insert the spreader and open the wound so that you can see to work. (See cut showing spreader in position.) The first thing that you will see is a thin skin or membrane covering the intestines. With the tearing hook make a small opening in this, which will bring the upper testicle into view, a small yellowish object about the size of a navy bean, lying up against the back bone, or nearly so, with a blue artery just back of it and sometimes attached to it. Care must be taken not to cut or tear this artery, or the bird is a dead one. Insert the testicle remover with the loops held tightly together, pushing the intestines back and out of the way when necessary with them. You will be able to see through the loops when you have them in the right place. Open the instrument and work the loops over the testicle, allowing it to shut gradually with the testicle inside the loops. Turn the tool half round, and back once or twice, so as to loosen the organ as much as possible. Be sure you have the grasping parts of the tool in the right position and then twist the testicle around a few times (like you would twist a cord or string), drawing the parts outward all the time so as to stretch the cords out for about an inch. Then reach in with the small knife blade and cut the twisted cords and membranes off about half way between the testicle and where they attach to the bird. (See illustration, "Cutting the Testicle Off.") Re-

Make the cut one inch long. If any blood should appear, pause a moment and wipe it with a bit of cotton.

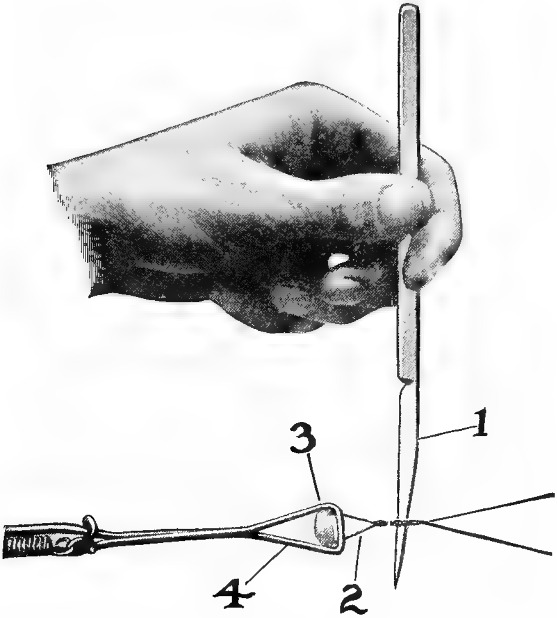


Making the cut. Press down hard. Be sure the knife goes through between the ribs.



Cutting the testicle off. Note the point of the knife under the organ. From a natural photograph.

move the spreader, turn the bird over and repeat the operation on the other side, proceeding as before. It is possible to get both testicles from the same side, but it is harder and much more dangerous to do; and the bird recovers just as quickly where it is opened up on both sides. Do not sew up the cut. When the capon gets on his feet the cut in the skin will be up under his wing and not over the ribs at all. (See illustrations on other pages of a dead bird, showing muscles.)

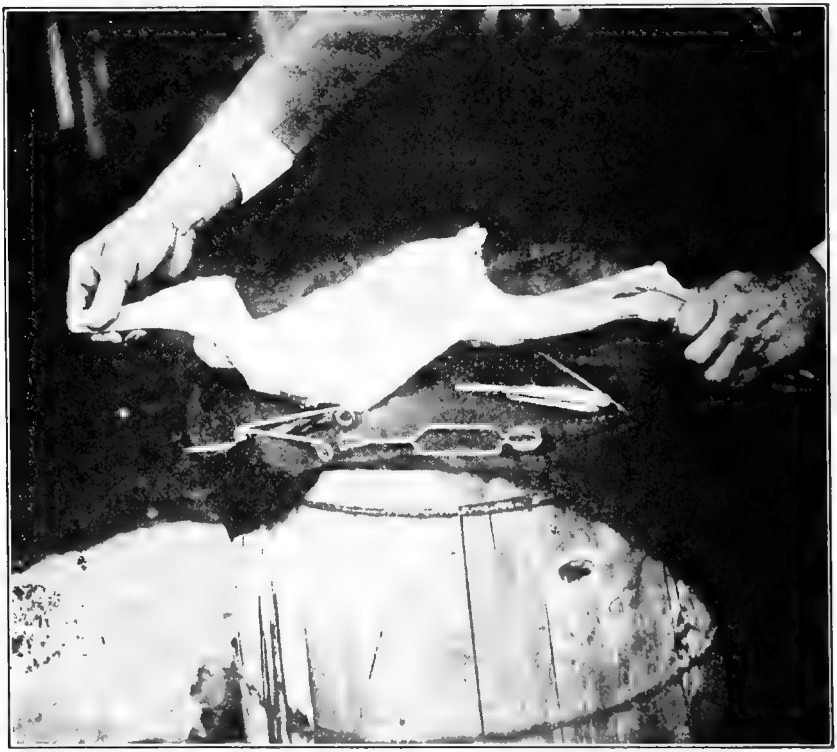


The business end of the removers. No. 4 shows the loops and safety clutch, with testicle (No 3) held firmly within its grasp. No. 2 represents the cords and attachments and No. 1 shows our thin bladed knife cutting the cords in the proper place and manner. You will note that the organ was first secured in the loops marked No. 4 and then the remover was turned round and round, so as to twist the cords as shown. The knife used to make the cut only.

CARE AFTER THE OPERATION

WIND PUFFS.

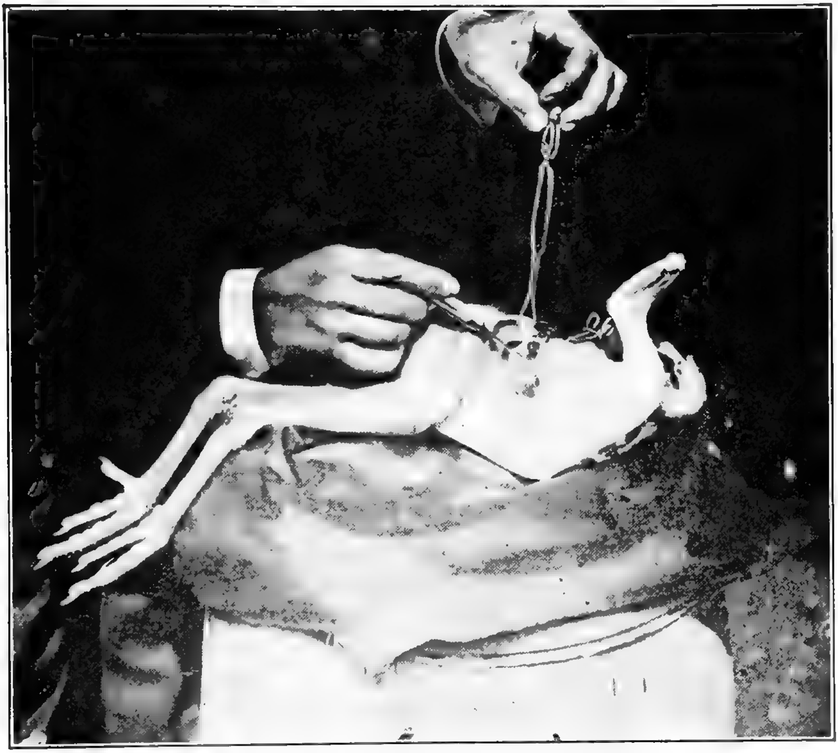
The birds will be ready for feed as soon as turned loose after the operation, but they should be watered first. Feed lightly of whatever they are accustomed to. Be sure to separate them so that not over eight or ten will go to roost in any one box or coop, as where there is a larger number together they will crowd and some will smother. After the second night following the operation they will be all right and may then be safely turned together. In three to four days after the operation some of the capons may develop wind puffs. This is caused by the cut healing too fast. It is not serious, simply air or wind under the skin. The remedy is to make an opening in the skin so as to let it escape. A pin or needle will not make a large enough opening; it is best to use a pair of scissors and cut out a small pinch of skin. This is just the outer skin of the bird and is void of feeling, so it does not cause the fowl any suffering. This will not be necessary in very many birds, but once in a while it will occur, more often in birds where the operation is performed from one side only. We have been told by physicians that the tools and knife should be kept in a pan containing a weak disinfecting solution while



· These three pictures are from photos of the same bird, dressed and skinned in order to show the muscles as they actually are. Note the first picture shows the bird stretched out and the incision made between the last two ribs. No muscles are cut. Simply a thin membrane.

the operation was being performed and that if this were done wind puffs could often be avoided. We cannot vouch for this, but it will do no harm and is worthy of trial.

In three or four days after the operation the capons may be allowed the free run of the place. They are great rustlers, more like a hen in actions and appearance than anything else. Yet they are different from all other feathered creatures, taking on fat in surprising amounts in proportion to the feed consumed. They will begin to fatten and their bodies apparently drop lower down and show that they are capons when about six months old. The American breeds will, if crowded along, weigh from ten to fifteen pounds when they are ten months of age. The operation may be performed at any time in any month of the year providing birds can be found that are "right" for the operation.



This shows the two ribs spread apart to bring the testicle in plain view so that the remover may be placed around it. The removers are then twisted around two or three times and the testicle then gently lifted toward the surface. The knife is then placed beneath the testicle to sever the cords.

We usually caponize the late fall chickens to use for foster mothers to take care of the early spring hatched chicks. Each winter we carry over about thirty to be used for that purpose. These fellows will then make fifteen pound capons for the following holiday season. They will command the very top prices, as the more they weigh, the more they are worth per pound.

PROPER FEED FOR CAPONS.

Feed the same as other poultry. They will do better, of course, on free range, but this is not essential. They are not subject to disease like other poultry, hence stand confinement well. Plenty of green feed is a big help. It makes them thrifty. For this purpose sowed oats, wheat or rye is best, but alfalfa is just about as good. Sprouted oats are excellent.

The main feed, however, should be corn—good yellow corn—all they can be induced to eat all the time. That is the proper way to feed it to capons for profit. Feed the other things mentioned in order to whet their appetites so they will eat more corn. Alfalfa meal wet with milk, either sour or sweet, is one of the best growing feeds we have ever tried. The last two weeks before marketing or butchering, confine them to a small yard and feed corn chop soaked in milk. Feed about four times a day, all that they can be coaxed to clean up good. This method will plump out the carcass and give that rich flavor and tenderness so much in demand.

The above illustration is the same bird after the operation has been performed and his thighs are brought back to their natural position. This shows that the incision is entirely covered and protected by the thigh.

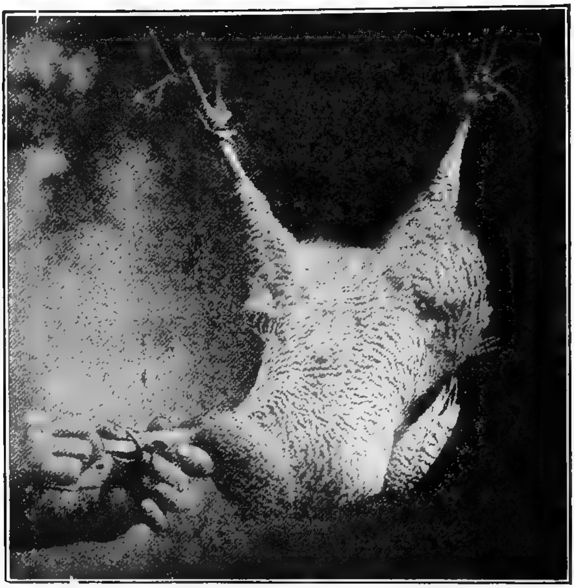
THE MARKETING OF CAPONS

Dealers will tell you that capons are in season or out of season, depending on the time of year that the inquiry is made. Capons, like strawberries, are good at any time of the year that you can get them. It takes capons from nine months to a year to mature. As chickens and other fowls are mostly hatched in the spring months, they will mature or get ripe during February, March and April, depending on the time that they were hatched. As there is no profit in holding them over during the summer months, or after they have become fully matured, it as a matter of course follows that they must be marketed during these three months; hence the so-called season. As incubators come into more general use and chicks are hatched at all seasons of the year, it may be possible to secure capons at all times. In selling capons on the open market to local produce dealers, if the best prices are expected the seller must be able to furnish enough capons at one time and properly finished to at least fill one crate. Any fair minded person can readily see that a dealer can not handle one or two capons so as to make a profit, as they do not sell well in mixed lots, generally going at hen prices. If you are growing them and expect to sell on the open market, always arrange to have at least two dozen to market together. The more you have the better prices you will be able to obtain. Dealers will bid much higher where there are enough birds to make it interesting.

Where several neighbors can arrange to club together and have their capons ready at the same time and all sell together much better prices can be realized. Small capons do not sell well, as they must possess size in order to show that they are real capons. The little ones look too much like small roosters. To bring top prices capons should weigh over eight pounds each. In this respect they are no different from other animals, as it is pretty well understood that runty, undersized steers or hogs do not command the best prices. Quality counts in capons as well as in all other animals. Pure bred fowls show up their quality and run much more even in all market requirements than common or mixed breeds, therefore it is desirable to use Standard or pure bred fowls for capons. Chickens and ducks make the best capons for profit. Turkeys and geese may be worked on, but have to be kept about two years to become fully matured, therefore are not so popular for caponizing. Barred Plymouth Rock chickens are perhaps the best for making capons. Their long back gives plenty of room to do the work. Their large size, yellow skin and legs, together with their quick growing qualities, makes them very desirable as capons. The fact that they are great winter layers makes it possible to get fertile eggs to incubate very early in the season. The greatest point in favor of Barred Rocks for capons is due to the fact that you can tell the males much sooner than in any other breed of fowls. In Barred Rocks the males can be told very often as soon as hatched, as they are always much lighter in color than the females. In some breeds of chickens, especially the solid colored birds, it is very hard to tell the males soon enough to make good capons. Outside of the facts mentioned any breed of fowls will make good capons.

Leghorns and the small breeds make good capon mothers and furnish capons with that gamey flavor so much favored by certain classes. It is well to remember that it will pay to raise a few capons whether you ever sell one or not. You cannot afford to be without them for your own use. The fact that they bring twice as much as any other class of poultry need not be considered. The point is they are the beast eating on earth. Everyone who has chickens at all should have some capons, especially when you can have them without any extra expense. One capon will more than pay for the tools to perform the operation. Dressed capons bring the highest prices. In dressing, it must be done in a way to show that it is a capon; otherwise, the purchaser could not tell for sure what it was and he might think it only a rooster. In order that there be no mistake on this point, custom and fashion long established has laid down certain rules that must be followed in dressing capons for the market.

One requirement is that the capons arrive in as nearly whole condition as possible. It is desirable that they be drawn; in fact, some state laws require it. In order to draw a fowl without mutilating the carcass, it is necessary that the bird not be allowed anything to eat for at least twenty-four hours before it is killed. Confined for that length of time without anything to eat the crop and intestines will become entirely empty. This makes these organs much smaller in size, as well as toughening them, thus permitting them to be taken out with ease.

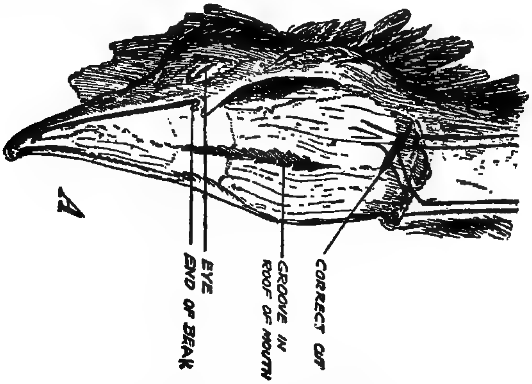


This shows the position in which the bird's head and the knife is held when the killing is done.

A capon's comb and wattles never grow after the operation and the real capon always has a pale look about the head, only the "slips" will redden up. In the real capon the head remains very small. The spur on a capon will develop slowly unless removed, the same as the horns on a steer. They will not get so large as the entire male's, but they will grow some just the same. For these reasons, the real capon must always have the head left on, together with a few neck feathers. That is his trade mark, so to speak. On a capon the tail feathers and coverlets are very long and abundant, and for that reason they must be left on. And just to give the carcass a finished look the feathers on the two outer joints of the wings are also left. The feet are left on and in some places where the market requires it a ring of feathers are left around each leg just about the knee joint.

Always dry pick your capon. Do not scald, as this would spoil the keeping qualities of the bird; besides, it would ruin the feathers. Capon feathers are valuable. They will more than pay for the dressing. They sell next to duck and geese feathers. All of the coarse hard feathers are left on the bird, only the soft downy ones being plucked.

As it is necessary for the capon head to remain on the carcass the only practical way to kill him is to stick him inside the mouth. As there are two veins that join under the skin in the back part of the mouth this is easily done, and much more humane than chopping their heads off anyway. The small blade of an ordinary pocket knife will be all that is required. (See cut for proper way to do it.) To make the stick, hang the capon up by his feet, as he will bleed much quicker and cleaner in this position and be ready to pick as soon as properly stuck. Reach the blade of the knife well back in his mouth, sharp edge up, and sever the veins as shown in the illustration. Then stick the point of the knife through the roof of the bird's mouth, so that the point will enter the brain. This will cause him to lose all feeling and will cause the feathers to loosen. After he is properly stuck you can pluck the feathers with ease; they will almost come out of their own accord after you learn to make the stick just right. It is a good scheme to have a small weight attached to a small hook to hang in his lower bill while picking. This will hold him still and prevent



The proper way to make the stick. The drawing shows where to find the arteries to cut.

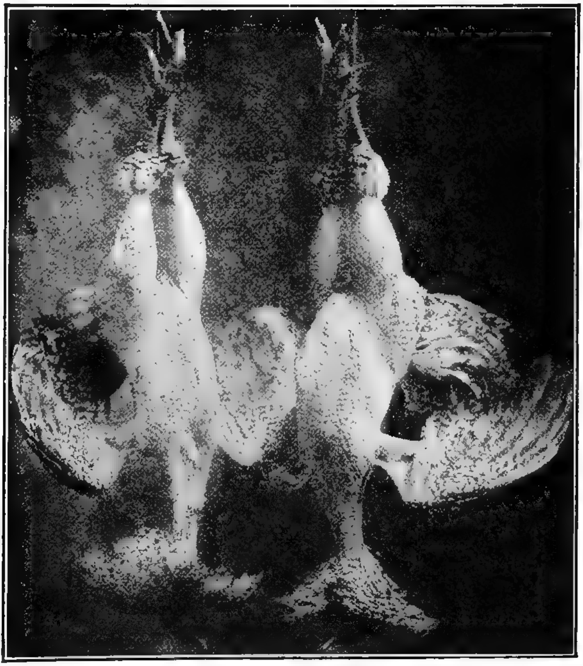


Photo by Deering. Just finished. Properly dressed. Weight twenty pounds, dressed ten pounds each. Worth twenty-five cents per pound, or five dollars for the pair.

swinging around. The bird properly plucked, all pin feathers and down having been removed, due care being taken not to tear or bruise the skin, the bird is ready to draw. It is best to have a table handy for this purpose. Lay the carcass on its back and cut around the vent. A great deal of fat will be found at this point, attached to the intestines; as you pull them out push the fat back into the bird. This fat will "bug out" at the opening when the bird is finished and give it a very rich, tempting appearance. When the end of the intestines is reached run the thumb and forefinger up inside the bird as far as possible and break them off, leaving everything else inside the bird. The crop is perfectly empty and clean, hence it is left in, as it could not be removed without spoiling the looks of the carcass. Now wash him thoroughly, being sure to get the feet and head clean. Sponge the breast very carefully. Hang up by the feet and allow to cool over night, then they will be ready to pack for shipment. Line a box or barrel with nice white paper and put the birds in breast down. If it is warm weather, put plenty of ice in top and bottom.

FACTS ABOUT CAPONS.

Capons are the most profitable part of the chicken business. They are not subject to disease like other poultry. Sold on the open market, capons will average at least twice as much per pound as hens.

A capon will average about twice as heavy and bring twice as much per pound, therefore a capon will sell for just four times as much money as the ordinary hen. The cost to raise the capon is just the same as for the hen.

Remember, it will pay you to have a few capons just for your own use, whether you ever intend to sell one or not. Capons, fat and well finished will bring on the market from $2.00 to $3.00 each, sold one at a time or in bunches. Capons are always in demand. The supply of capons is never equal to market requirements.

CAPON MARKET GUARANTEED.

We guarantee to furnish you a ready market at the top prices for any or all capons that you can furnish, fat and well finished. They will usually bring more, but it is safe to figure that they will sell for twice as much per pound as the average price of hens. Capons sold on the open market AVERAGE US THREE DOLLARS each. Only the best cockerels are kept for breeders. We must have as much for them as they would bring as capons.

The bigger the capon the more he will bring per pound. Early spring hatched chicks make the very best capons and bring the highest prices. Late summer and fall hatched chicks make the best capons to use as mothers for little chicks.

In caponizing the only loss worth considering will be from the "slips" that you make. There are never enough birds killed in operating to amount to anything, and if this should happen the bird is just as good to eat as if killed in any other way. Where the old style instruments were used fully half the birds worked would develop into "slips," no matter how expert the operator might be. With the new Automatic Capon Tools any one can make real capons every time.

These new tools have a safety clutch that prevents "slips."

A "SLIP" is a bird that has been operated on and a part of the organ or its attachment left inside the bird. Where this occurs Nature attempts to grow a new organ and a "slip" or staggy bird results. And, like a stag in other animals, he is docked or sold for less money on the market. With the tool illustrated on the previous pages you can see through the loops all the time and know what you are doing, therefore you get no '"slips."

EASTERN CAPON BUYERS.

The following list of reliable capon buyers is just a very few of the best selected from all parts of the country. There are hundreds of others, and no doubt one close to you. With this list you will have no trouble in finding a good market, no matter where you are located.

ZELLERS & TAYLOR, Bordertown, N. J., supply New York market.

BATCHELDER-SNYDER CO., Blackstone St., Boston, Mass.

WALTER A. TUTTLE, Scott St., Buffalo, N. Y.

GEORGE OLIVER & CO., Produce, New York City, West Hampton Market, N. Y.

MYERS WELL & CO., Produce, Cleveland, Ohio.

PHILIP QUIGLEY, Produce, 345 Front St., Philadelphia, Pa.

EDSON BROS. PRODUCE CO., Philadelphia, Pa.

F. W. WHEELER & CO., Produce, 93 Clinton St., Boston, Mass.

HAZLEGROVE & CO., 14 S. 13th St., Richmond, Va.

PENINSULAR PRODUCE CO., 23 Cedar St., Jacksonville, Fla.

TAMPA SANITARY POULTRY CO., Box 666, Tampa, Fla.

WALLIS & SCOTT, Produce, Tampa, Fla.

CAPON BUYERS OF CENTRAL AND SOUTHERN STATES.

E. R. JAQUES & SON, Produce, Home Office at Thornton, Ind. This firm also buys capons at Lebanon, LaFayette and Petersburg, Ind.

I. P. ALMERAS PRODUCE CO., 2415 Strand St., Galveston, Texas.

W. N. GUTHRIE WHOLESALE PRODUCE CO., Rogers, Tenn.

SWIFT & CO., Enid, Okla.

A. A. JACKSON & CO., Dallas, Texas.

SWIFT & CO., Des Moines, Iowa.

DE SOTO CREAM & PRODUCE CO., Minneapolis, Minn.

PERRY COMMISSION CO., Omaha, Neb.

NATIONAL POULTRY PRODUCE CO., Falls City, Neb.

S. P. POND & CO., Produce, Keokuk, Iowa.

PAQUETTE CASH MARKET, 520 Pearl St., Sioux City, Iowa.

GEO. L. COLLINS & CO., Produce, Detroit, Mich..

CARTER & LEHR PRODUCE CO., Detroit, Mich.

SEYMOUR PACKING CO., Topeka, Kan. This firm also buys at Winfield and Solomon, Kas.

SWIFT & CO., Parsons, Kas.

MEEK & CO., Wholesale Produce, Fourth and Monroe Sts., Topeka, Kas.

COPES SALE SYSTEM, Box 155, Topeka, Kas.

NATIONAL POULTRY CO., Atchison, Kas.

SWIFT & CO., Wichita, Kas.

H. L. BROWN & SON PRODUCE CO., 219 S. Water St., Chicago, Ill.

GALLAGHER BROS. PRODUCE CO., 165 S. W. Water St., Chicago, Ill.

NATIONAL POULTRY CO., Atchison, Kas.

RICHARD BUTLER PRODUCE CO., Walnut St., Kansas City, Mo.

J. R. PEDEN PRODUCE CO., Walnut St., Kansas City, Mo.

A. W. BEAR & CO., Kansas City, Mo.

AARON BROS., Produce, Walnut St., Kansas City, Mo.

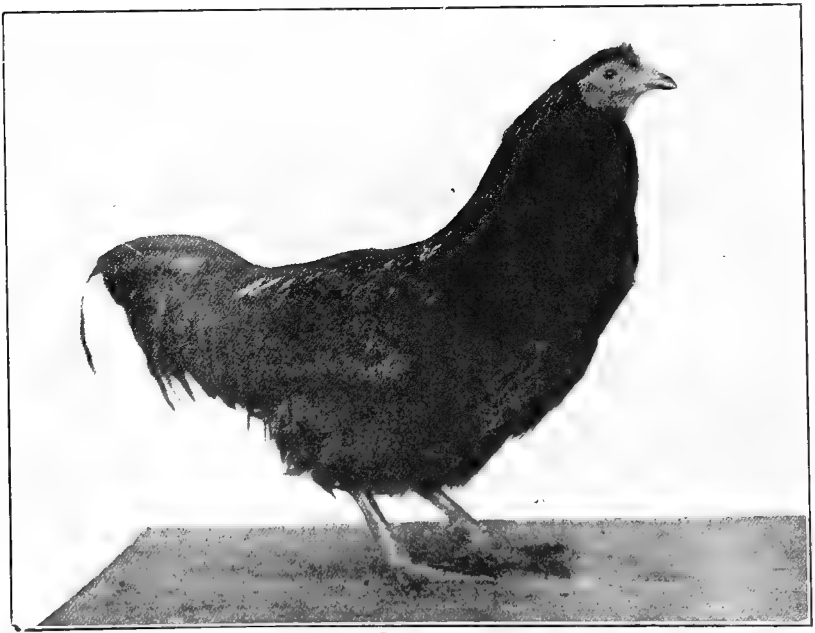
KANSAS POULTRY PRODUCE CO., Kansas City, Mo., Stall 2, City Market.

EUREKA PRODUCE COMMISSION CO., St. Louis, Mo.

F. W. BROCKMAN PRODUCE CO., St. Louis, Mo.
McLAIN & ALCOM PRODUCE CO., St. Louis, Mo.
MEMPHIS HOTEL CO., care Peabody Hotel, Memphis, Tenn.
CALANZANO BROS., Produce, 1822 Fourth St. Birmingham, Ala.
JOHN BONURA & CO., Front St., New Orleans, La.
BIRMINGHAM PRODUCE CO., Birmingham, Ala.
SAVANNAH PRODUCE CO., Savannah, Ga.
WILLIAM SCHMIDT, Produce, Fort Worth, Texas.
MERCHANTS' PRODUCE CO., Dallas, Texas.

WESTERN CAPON BUYERS.

PAGE & SON, Produce, Portland, Ore.
CALIFORNIA POULTRY CO., The Stalls, 122 California Market, San Francisco Calif.
KEYSTONE POULTRY & EGG CO., 16 California, San Francisco, Calif.
H. L. GRIFFIN PRODUCE CO., Ogden, Utah.
THE PINKETT BROS. PRODUCE CO., 1625 Market St., Denver, Colo.
THE RHODES RANCH EGG CO., Denver, Colo.
EPPEL PRODUCE CO., Denver, Colo.
EMMETT PRODUCE CO., Emmett, Idaho.



This shows the necessity of fattening your capons. This R. I. Red capon is seven months old. He is vigorous but thin. When they reach this stage you can double their weight in a very short time.

FIFTEEN STEPS IN CAPONIZING

By S. K. Burdin, Toronto, Canada.

Nearly all authors claim that cockerels can be successfully caponized between the ages of two to six months, and illustrate the operation by showing birds in an advanced stage of development (fully feathered and large combs). This error is directly responsible for countless failures, and shows their lack of having comprehended the rudiments of what is essential for success. When birds are "just right," however, results are all that can be desired, and the flesh will remain as sweet and tender as a broiler, or as it was at time operated on.

For market purposes any of the American, English or Asiatic breeds, or their first crosses, are desirable, and the capons should be kept till they weigh eight pounds or better. The season when the prices are usually most attractive is from Christmas to Easter inclusive.

You will observe that the above classification or selection does not include the various Mediterranean classes. I regret that custom has decreed or been responsible for this, and while the demands of certain large markets are sufficiently emphatic to create "custom," yet I am convinced present so-called customs are really chargeable to the same cause—poor tools and unsatisfactory results—or inability to caponize the smaller breeds owing to clumsy instruments. At any rate markets are subject to education, and they should yield as readily on this as any other question, where a demand is to be created for a valuable staple article of food, and should readily accept capons of the smaller or lighter breeds.

If you are only raising a few for your own use, caponize the cockerels and your meat supply can be spread over the entire year instead of being compelled to use or dispose of them while young. This applies to all breeds, whether large or small,and if they are fed the same as hens or pullets, they will be ready to use any time between the ages of four and eighteen months. They can run anywhere, but do the best in a pen by themselves.

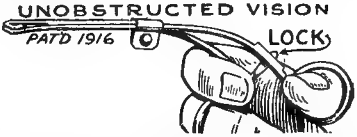
Let us take stock, as it were, and see what caponizing means to the poultry interests when the operation can really be performed successfully.

1. The youngsters—pullets and capons—grow faster and develop better.
2. Keeps your flocks orderly. Reduces noise, quarreling and feed bills, and aids in infertile egg production.
3. Their value increases with age, until full maturity is reached.
4. You can watch markets and take advantage of high prices and increased growth.
5. You can enjoy the greatest luxury, on your own table, known to king or peasant, at a cost less than that of ordinary cockerels.
6. A reputation is easily built up and maintained for the highest grade of table poultry known, enabling you to choose your customers and practically fix your own prices.
7. As foster-mothers the capon will stop your losses from hawks and crows and solve many of your brooding problems.
8. As a means of conserving resources, increasing quantity, improving quality, and as a source of greater efficiency, pleasure, satisfaction and profit, caponizing is one of the greatest assets poultry raising possesses today.

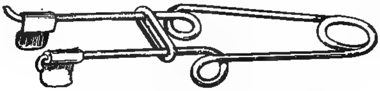
INSTRUMENTS.

Operating Table (Recommended)—After trying many different designs I am convinced that the one shown herewith is the most convenient, simple and practical yet devised. Quick adjustment to the varying conditions or sources of light is most important. This table meets every requirement. It is quickly and easily made, consisting of two (2) pieces of one inch pine boards, twelve inches wide, twenty inches long and hinged together at one end as shown. Wire nails for holding the bird stretched out are driven along the edges of one piece two inches apart. To secure the desired angle use a loose block between the boards and move it forward or backward. Made in twenty minutes, costs about twenty cents.

Restraining Cords and Weights—These may be of any suitable material. The weights should be about a half pound each. The cords work best when attached to the weights in such a manner as to allow the weights to move or center themselves easily. This is accomplished by wrapping a cord about the weight and tying it the same as a parcel; then run a longer piece under it, tying the two ends (of long piece) together making it like a hoop or band, the desired length. This arrangement will be found very convenient when wrapping the cord about the feet or hooking them back of the wings, as the weight will always be in the right place, as it slides or centers quickly.



Cut No. 2.
The carefully beveled, narrow surfaced, accurately adjusted gripping parts, coupled with the free action, unobstructed vision features, enables the operator to use this remover with great ease and certainty—no fumbling, bungling or guess work. Note how instrument is held in the hand.



Cut No. 3.
Showing Detail of Spreaders.

Spreaders—Much of the success of an operation depends upon the spreaders used. The successful spreader is one that can be easily inserted, will stay in position, hold the incision open properly, and not be in the way during the operation.

Tearing Hook—This instrument is for making an opening through the lining (peritoneum), which covers the intestines and hides the testicles.

Knife—The knife used in caponizing should be of good material so as to hold a kneen edge, and have a sharp tapering point. Do not use a blunt, dull knife; it is useless and cruel.

WHEN TO CAPONIZE.

This does not refer to the time of year or time of day, but to the age or stage of development. Caponizing may be done by the use of natural or artificial light at any time during the day or night, and any time during the year when birds of suitable size are available.

There is a general tendency of allowing cockerels to get too large before operating. This tendency is due to two causes: First, the erroneous theory heretofore taught that they can be successfully caponized at six months of age. Second, they are often larger and more advanced than they appear as they are running about the yard. If necessary, weigh them.

There cannot be any hard and fast rule laid down because of the varying characteristic of the different breeds, different strains and different conditions under which chicks are kept and fed. Speaking in general terms of the American, English or Asiatic breeds and their crosses, the cockerels should be fairly well feathered, be from two to three months old and weigh from one to two pounds each. This applies only to thrifty, healthy birds. See Cut No. 4.

Birds that have been stunted through crowding, or other causes, will be found often too far advanced sexually when about right in size or weight. Runts, scrubs and mongrels do not make even, prime and satisfactory market capons. These should be used on the home table.

The state of development, however, is a better guide. When the comb and wattles begin to get red and grow, the organs begin to develop also, and when the organs are about the size of a good plump kernel of wheat they are right for best results.

Cut No. 4.
Bird at left just right. One at right too large and too old.

There is a period of from two to three weeks when the operation should be uniformly successful. Later than this the danger of deaths and "slips" increases rapidly. A little experience will help you to tell when they are right for best results.

The same rules apply for the smaller, or Mediterranean breeds, excepting that they must be worked earlier or when smaller. These should be caponized when weighing ten to eighteen ounces, the lighter weight preferably, or before their combs and organs become too much developed.

In caponizing turkeys they should be operated upon as soon as sex is distinguishable—or as soon as they begin to "shoot-the-red." All the tools and instructions apply to turkeys the same as for cockerels of the larger breeds.

STARVING OR FASTING..

The birds should be kept from all food and water for about thirty-six hours. This allows the intestines to become empty and fall away, allowing plenty of room in the abdominal cavity to see and work.

Put the birds in a dark, cool place in a coop with a slat or wire bottom. This insures clean feet, no litter or droppings to pick, and the birds are comfortable and in first-class condition. Cockerels confined before feeding Friday morning are ready Saturday noon, etc.

I prefer to operate early in the morning, before the sun is high and hot. In such an event the birds should be confined before their supper on Thursday night.

DISTINGUISHING COCKERELS FROM PULLETS.

In all single comb varieties it is easy to distinguish the sexes, but with rose comb varieties it is more difficult (especially for the inexperenced) at the proper time, or early enough for best results.

However, with a little practice you will be able to select them by their appearance. Cockerels have larger, broader heads and bolder eyes, while the feet and legs are larger also.

Should a pullet find her way to your operating table no injury need result, if you use ordinary care. More will be said about this point later.

WHICH ORGAN TO REMOVE FIRST.

As a result of very careful observation I am led to make the following suggestions and recommendations.

There are as many varying or different characteristics among birds internally as externally. I doubt if there are two specimens that are identical. True, many are practically so, yet many will differ so radically that a novice will quickly recognize it, and it is only by preparing you for such irregularities,. of their internal arrangement, that you will be able to meet them successfully.

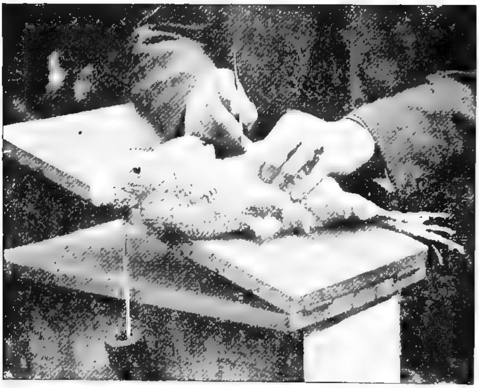
The left organ is usually uniform in size, location and appearance, but the right will frequently differ in all three particulars. The left is easier also to find and remove, therefore I always recommend starting on the left side. There is still another reason.

Pullets have only one ovary. This is located on the left side. Therefore, if you should get a pullet by mistake, the error would be easily recognized upon making the first incision. The ovary will be described elsewhere. (See Step 12—Removal of Left Testicle).

ABOUT ONE OR TWO INCISIONS.

As previously noted, under "When to Caponize," best results are obtained by operating on the bird when the organs are small.

In order, however, to remove both from one incision, the operation must be delayed until the organs are larger and hang more pendant, or the operator cannot locate and grasp the lower one properly. This brings the birds up to an age and size where the chances of deaths and "slips" are greatly increased; therefore, I prefer working them when younger (making two incissions) when success is much greater. However, I am not going to say, as one author does, that the "birds do better where two incisions are made," but I am prepared to say, after many experiments, it is impossible to tell from any outward appearance, other than the wounds, those with one or those with two incisions. One appears to do as well as the other after the operation.



Cut No. 5.

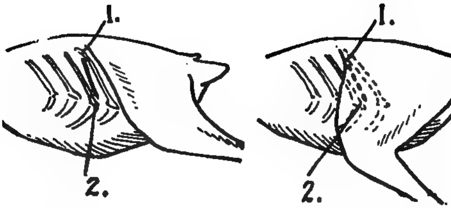
This cut shows bird properly restrained or fastened on the operating table, for removal of left testicle, feathers removed and last rib located. The cord is wrapped once around the legs; it need not be wrapped around the wings—just caught back of them. The weights shown here are "Sash Weights." Any material of desired weight, like brick, stone or metal will answer. Note position of bird on the table, fingers of left hand and of the knife in the right.

But, for the reasons stated, I strongly recommend a double or two-incision operation. You are nearer the organs, you can work smaller or younger birds, and your success will be correspondingly greater.

Don't work birds too large or too far developed.. Caponize them as fast as they are ready, whether you have one or one hundred.

LIGHT.

Good light is essential. For the beginner weak sunlight is recommended. Artificial light can be used successfully with a little practice. Steady light is imperative. A cloudy day (first sun, then shadow) is unsatisfactory, as the eyes cannot adjust themselves to the sudden changes.



A B

Cut No 5½.

"A" shows where incision is made.

"B" shows how the thigh moves forward and covers incision between ribs (see dotted lines) when bird is released, thus making wound self-closing—no "stitching up" or dressing of any sort needed.

A large window, or open shed, facing north or east, will be found very satisfactory. Light can be too bright as well as not bright enough, as it makes too sharp lines of demarcation between shadow and sunshine.

REMOVAL OF LEFT ORGAN.

Personally I see no advantage in operating on a dead bird before a live one is used. If you wish to use the dead bird, however, kill one of those you have starved by knocking it on the head, this leaves all the blood in the body, so veins will show about the organs the same as in a live one, and proceed as directed for live birds.

See that everything is ready. Have a shallow basin of clean water and a sponge or clean cloth handy. See that the knife has been sharpened to a keen edge and point, on a fine oil or whetstone. (Do not use a coarse sharpener; it will ruin the edge.)

Place the operating board upon a barrel, or use a narrow box as shown in Cut No. 8. If a barrel is used, let the weights drop down inside. A box, as shown, makes a most convenient arrangement, as there is a place to lay instruments, set a dish or any other small article. Also, when changing or turning bird over all that is necessary is to seize the bird by the feet and wings, grasping the cord at same time, and lift bird up and change ends or turn over, without detaching and attaching weights.

Step No. 1—Place bird in position as shown in Cut No. 5. Wind cord once around feet and once around nail. Hook other cord back of wings, stretch bird out and wind cord once round nail. Bird is held firmly in this way without strain, as is the case with heavy weights.

Step No. 2—Pluck the feathers in front of hip and over the short ribs.

Step No. 3—Take knife in hand as shown, letting the point extend about half an inch below the middle finger.

Step No. 4—Standing behind and at its back, press fingers of left hand between hip and ribs as shown. This will reveal the last rib. Place point of knife between the last two or just in front of the last one. Keep fingers of left hand well pressed down so the rib shows plainly. (See Cuts Nos. 5 and 5½.)

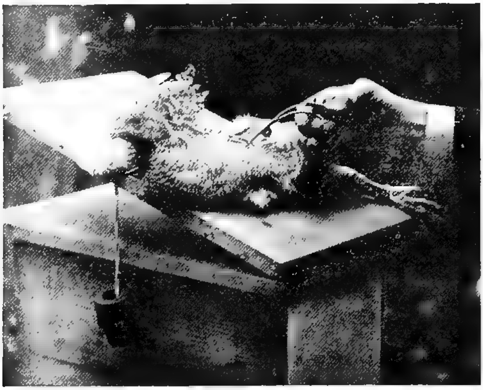
Step No. 5—Now, with a firm quick pressure, plunge the knife down into the abdomen, between the ribs, until the end of the middle finger hits. No danger of going too deep, as the finger acts as a guide; so don't be afraid, just give it a good firm stroke or pressure. Make the incision not over ⅝ to ¾ of an inch long keeping as far away from the back as the angle in the ribs will allow. Keep the left hand firmly pressed back of the rib and do not remove it until you have placed spreader in position.

Step No. 6—If there should be considerable blood from the incision, pause a moment until it begins to clot and then wash it off.

Step No. 7—Insert spreaders by pressing the lips together with right hand, giving it a slightly rolling or rocking movement as you place the blades or lips into the incision. Press them down until the handles or wires strike the ribs, then release pressure slowly. The spreader will now point over bird's back, which brings the longest lip or blade against the last or weakest rib for which it is especially designed.

Step No. 8—Now come from behind or back of the bird and work from in front. If the wound is bloody it is well to sponge it off again, using a moist sponge or cloth to avoid getting water in the incision.

Step No. 9—Take tearing hook and make an opening through the thin filmy membrane (peritoneum) that covers the bowels and hides the testicles. Be careful not to catch hold of intestines with the hook. If birds have been kept without food and water, as directed, with no litter or droppings to pick at, their bowels will give no trouble, but it is well to go a little slow and be careful until you learn the proper course of procedure. Make this opening about the same size and directly under the incision.



Cut No. 6.

This cut shows the final locking of Remover prior to withdrawing. Note the way the Spreader points over the back, and position of the hand and instrument.

Step No. 10—Now tilt or adjust your table until the light falls into the opening properly. This is done by changing the angle of the upper part, and also moving the table and smaller box to the right or left.

Step No. 11—Now examine the opening, the intestines and the general internal conditions. The testicle is just above the backbone and slightly to the left of opening. It should be easily located, though sometimes it will be covered up with the bowels. It should be about the size of a good plump kernel of wheat, or a very small navy bean, and of a yellowish color, though sometimes they are dark, owing to congestion of some slight degree.

Step No. 12—If not in full view and easily distinguishable, take the blunt end of the Tearing Hook and gently press the bowels down and away until you can see the organ plainly, moving the table if necessary to allow the light to fall fully upon it. You should have no trouble to distinguish the organ, as it is unlike any of its surroundings in color, shape and size. If by any chance you have a pullet, instead of a testicle, and in exactly the same place, you will find her ovary. This will be yellowish in color, flat in shape and look like fish eggs or little yellow blubbers. Release her, allowing her to run with the capons for a few days.

Step No. 13—Do not hurry. The bird is not suffering. Look for the spermatic artery that runs just back of the organ. It is not always visible, though always there. It may usually be seen pulsating by looking at either end of the testicle. It is darker than its surroundings and is usually well defined. If this artery is gripped by the Remover it may be ruptured and the bird will die. There is plenty of room between it and the organ for the gripping parts of the Remover, so there is little danger of killing the bird; if you do, it is in perfect health, simply pluck and cook it.

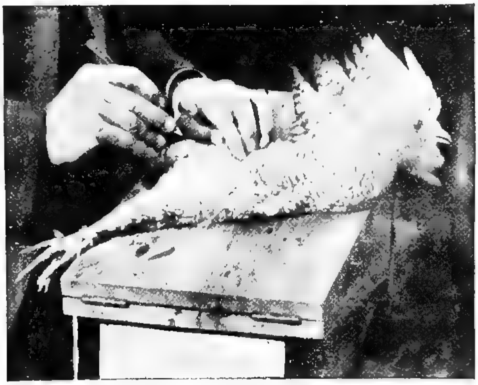
Step No. 14—Now take Removers, close them, insert them in the opening, being careful to keep them closed, but not locked. Place them under the organ and raise them up till it falls off. It will be observed to be slightly pendant or hanging down. If the bird struggles, on account of the tickling sensation caused by this action, don't try to withdraw the

Remover; simply keep it closed until the bird stops struggling. Now open and close the Remover once or twice, without withdrawing it, being particular to close or bring the gripping parts together very lightly. In this position anything like a cord or sinew would slip through between them easily, while if closed together too hard they would hold firmly everything within their grasp. On this point **much of your success or failure depends.** Now grasp the organ **lightly,** being careful to get it as nearly in the center of the instrument as possible. Then turn your hand slightly to right and left, at the same time drawing the instrument towards you just enough to make the organ fit snugly against the gripping parts. Don't lock the instrument yet. If it was closed lightly before being drawn towards you, the cords sustaining the testicle would slip through between the gripping parts, thus stretching the testicle out enough to clear the artery. Now ease back a trifle and then add sufficient pressure to lock the remover. See Cut No. 6.

Step No. 15—All that is necessary now to complete the operation is to withdraw the instrument, bringing with it the organ and its attachments. No twisting or cutting, just a straight gentle pull that removes all cords and attachments clean, leaving nothing to grow or develop. See Cut No. 9. If the bird was at the right age or stage of development, and the foregoing points carefully observed, there is little danger of death, and practically no danger of a "slip." But if the artery is ruptured, death is certain; or if the cords and attachments are not all brought away with the organ, a "slip" is inevitable. With a little experience you will be able to tell by the resistance offered whether you have gripped the artery or not. When this occurs, unlock and take a new hold, thus saving your bird.

REMOVAL OF RIGHT ORGAN.

Turn the bird over, or change ends with him, (following directions given just before Step No. 1—Removal of Left Organ), and follow carefully each step, from 1 to 8 inclusive, as laid down for removal of that organ, excepting that you stand as shown in Cut No. 7 and have Spreader point in opposite direction, or as shown in Cut No. 8.



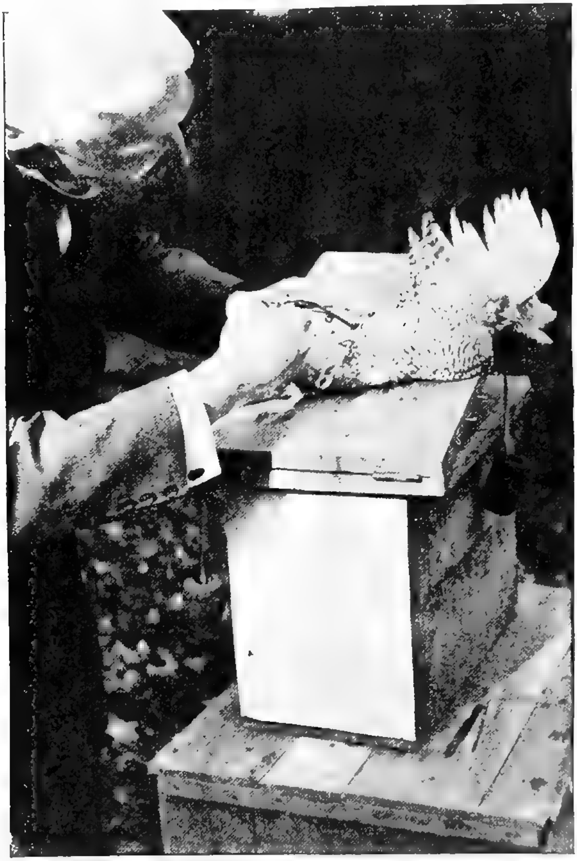
Cut No. 7.

This shows bird in position for removal of right organ, feathers removed and last rib located. Note position of bird on operating table, position of first two fingers of left hand and the way the knife is held in the right.

(Regarding where to stand and how to locate place to make the incision, should be reversed by "left-handed" persons.)

Step No. 9—In making the opening through lining (peritoneum) on the right side, care must be taken to work well back towards the bird's hip and open into the abdominal cavity, or over the intestines. Pay particular attention to this, because it is very easy to get too far forward and open through the midriff or diaphragm into the lung cavity, instead of into the abdominal cavity. In such an event the organ will not be found at all, as it is located back of the diaphragm. If the lining, however, is opened in the proper place, the organ may be located in the same manner as it was upon the left side. Remember it is just back of the diaphragm.

Step No. 10—Follow Step No. 10 as given for left organ.



Cut No. 8.

Gripping the right organ, note how the light falls directly into the incision and onto the testicle. Note how the hand and instrument are all below the line of vision—no shadows or uncertainty. This operating table will fit any bird and is easily adjusted to any condition of light. It can be made by any one in twenty minutes, and costs about twenty cents. Place it on a barrel or box as shown above.

Steps Nos. 11 to 15—As previously mentioned, the right organ may vary somewhat in different specimens, in size, shape and location, and is the most difficult one to remove. However, all the directions as given from Nos. 11 to 15 for removal of the left apply also to the right organ, with perhaps one exception. In removing the left organ I urged you to get the organ in the center as nearly as possible before locking the Remover. In removing the right, owing to its position, it will be found necessary occasionally to work the organ into the corner, as it were, of the Remover, so as to get as far away from the spermatic artery as possible.

To illustrate:—The artery usually runs parallel to the backbone. The normal organ is longer than its diameter, and its normal position is parallel with the artery and backbone, but it may also be nearly at right angles or perpendicular to them. In such an event, it is necessary to work the organ well into the corner on the left side of the Remover before its final locking, so as to get away from the artery. Especially is this necessary in working small birds, or breeds. Your principal difficulties will be met in removing the right organ. **Don't pinch or mangle the testicles.**

REMOVING BOTH ORGANS THROUGH ONE INCISION.

If, however, you wish to operate from one incision, the work must all be done from the right side. Follow directions for right side (making a slightly larger incision) and when ready remove the lower or left organ first and then the upper or right organ last.

This operation is not recommended, for the reason previously given. If attempted, however, wait until you have had considerable experience in caponizing.

CARE OF INSTRUMENTS WHILE OPERATING.

A mild solution of any of the commercial disinfectants is usually recommended. The main thing, however, is to keep the tools reasonably clean. If they are wiped off frequently with a damp cloth or sponge this is all that is necessary.

CARE AFTER THE OPERATION.

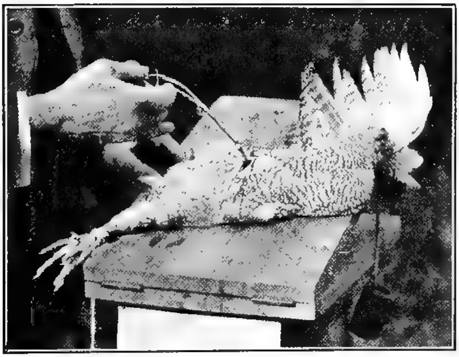
Provide a wet mash, shade and drinking water. Mark them in some permanent manner. Keep them by themselves for about a week, and where you can catch them at will. Provide low roosts or let them sit on the floor at night. Give the usual ration after the second day. Some put them back in in their runs immediately after the operation, but it is better to keep them separate for a few days at least.

BLOATING OR WIND PUFFS.

Next day after caponizing look the birds over for Wind Puffs. Some will be found to look too "plump" or too round. This is because of air under the skin. Either open the wound and let the air out, or make a new opening up near the wing. A toe punch is ideal for this as it makes (or should) two small round holes, letting the air out quickly. A sharp pointed knife will also be found handy and efficient. Do this daily until puffing stops.

"SLIPS OR FAILURES."

There will usually be a few "slips," especially at first, or until you get better acquainted with the operation and its requirements. These will be distinguishable in from four to eight weeks after the operation. As soon as their true character can be determined, they should be regarded as cockerels and treated as such, killing them for home or market purposes before they get too old.



Cut No. 9.

This cut shows the final removal of the right organ. Note the light spot in gripping parts and the dark streak leading into the incision. This shows the testicle and cords as they should appear when brought away for successful results.

FEEDING TIME ON RANGE.

Whether raising poultry for pleasure, profit, utility or exhibition purposes, the capon is the most satisfactory mother yet found. His conduct is so easy, graceful and efficient, he beats a hen at her own job and makes her appear like a novice.

SUGGESTIONS FOR PRACTICE

1. After a young male bird has been killed and dismembered for cooking, take the back and look at the testicles. Notice where they are located. Note the location of the last two ribs. Examine to see if you can locate the artery which runs down the back near the testicles. Pull the male organs loose from the back with the thumb and forefingers and note the cords holding same.

2. After a chicken has been killed and picked, take your instruments, locate the last two ribs, make an incision and remove the organ from the dead bird. Turn it over and do the same on the opposite side.

3. Now you are ready to practice on some live specimens. Be sure that your birds have been conditioned as recommended in this lesson, and that they are of the proper age. Have no fear. You are certain to succeed. The operation is really very simple.

QUESTIONS ON CAPONS AND CAPONIZING.

Lesson No. 32.

1. What is a Capon? Describe the difference in appearance between a cockerel and a capon.
2. How long before operating should the cockerels be selected?
3. What is the first and most important thing which we must keep in mind in making Capons?
4. What is the second most essential thing?
5. Is it best for the beginner to operate from one side or from both sides? Why?
6. In case the operation is performed only from one side, which male organ should be removed first, the upper or lower? Why?
7. At what age or size should cockerels be caponized?
8. With reference to the location of the ribs, where should the incision be made?
9. Why is it necessary for the intestines to be empty?
10. Should the remover be placed on the organ itself, or should it be just below the organ when removing it?

The King of the Poultry Yard

Turkeys are a very profitable fowl if the grower understands the correct method of breeding, hatching and rearing them. More turkeys should be grown by the average poultryman. The turkey crop has decreased 44 per cent in the last ten years. This is one bird of which all Americans are proud. It was originally one of our native wild birds and they are yet found in some sections in their wild state. Most turkey breeders have not given the study to turkey culture that have breeders of other varieties of poultry.

Especially are they adapted to the general farms. Mammoth Bronze, White Holland and Bourbon Red appear to be three of the most popular varieties. While the market seems to call for a large turkey in most cases, yet the best breeders are those of medium size. The overly large turkeys are in great demand for exhibition purposes and for special holiday trade, yet when it comes to the breeding pen, we would use large or at least good sized hens with medium or good sized toms.

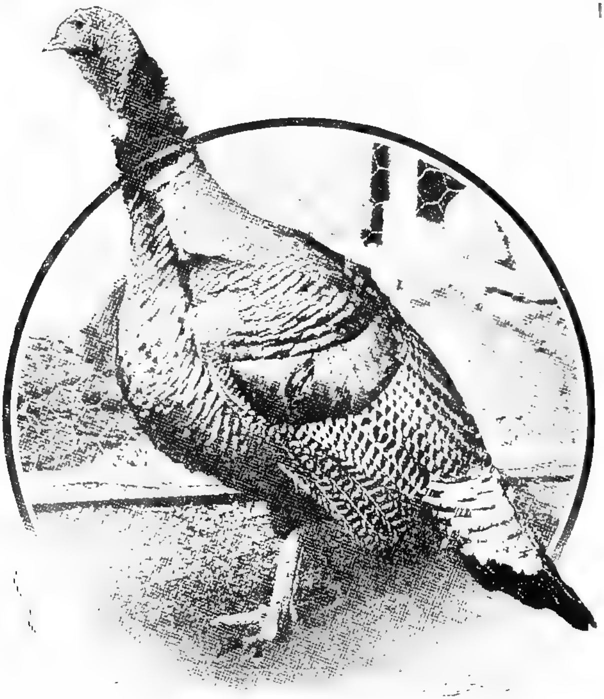
Vitality counts in turkeys as well as in all other poultry. The breeding stock should have big shanks and a stout appearance throughout. Never breed from a turkey which has a dead look to its plumage. The luster and richness indicate health.

Whatever you do, keep but one variety of turkeys and give them the range of the farm, except during the breeding season. By all means you must avoid inbreeding and careless selection. Do not breed from immature stock. We prefer to incubate the eggs with chicken hens, and we prefer to raise them with turkey hens as mothers. In fact, we have never been successful with any other method. In the very beginning we would like to impress eight vital points which should be remembered in raising turkeys:

1. Use mature breeding stock of high vitality.
2. Take some precaution once a week to keep the poults free from lice.
3. Do not inbreed.
4. Never let the poults or growing stock run to an oat field.
5. If the mature turkeys or growing stock show signs of being out of condition, give them about one-half teaspoonful of epsom salts, dissolved in water, or give a tablespoonful of castor oil. Clear the intestinal tract in this way and then feed a slightly moistened mash without too much cornmeal or fattening food in it.
6. Feed the poults very sparingly. Feed about half of what you really feel they should have. More poults are killed by overfeeding and head lice than all other causes combined.
7. Do not allow the turkey hen to wander too far with the poults for the first few days. After they have sufficient strength, allow them to have free range.
8. Turkeys have practically the same diseases that chickens have, and we use the same treatments on our turkeys as we do with other poultry.

MATING TURKEYS.

There is but one system to follow in mating turkeys. Any and all varieties require the same system and that is to select fowls full of vigor in every instance. Never, under any circumstances, do we mate any other. If you expect a choice flock of turkeys, either for exhibition or market, you must select breeders that have plenty of snap and are full of life, birds that have never been sick or stunted in growth from any cause. To have a successful hatch and to have poults which live, we must select turkeys that have all these requirements. After vigor, we consider size. Then the next thing, we select for fine plumage. Thousands of what would be fine and valuable turkeys are practically worthless because the breeder is a color fiend. It is not all color that goes to make a valuable turkey. You must have some size, because nine customers out of ten call for size. For market purposes, large, plump, fat turkeys bring the best price in every instance, hence, size is considered first, then color. There is considerable more value and importance to mating turkeys properly than the average grower realizes. This is a very difficult proposition. The idea of buying little scrubs by the pound for breeders, just because they are cheap, is absurd. No matter what your purpose in breeding is, make a rule to have only the very best for breeders, even if they do cost the most. They are the cheapest in the end. The cheapest turkeys we ever purchased were the best we could get at a long price, as considered by the average turkey grower. They were the best breeders, their progeny brought us the most money of any turkeys we ever owned. However, it is not the rule that the largest turkeys are the best breeders, or will make the highest scoring specimens. No matter how well they may be bred, if they are overgrown they are almost worthless as breeders. What we want is good proportions and the happy medium in size in breeding stock.



A Mammoth Bronze Tom. This seems to be one of the most popular varieties and is the largest of all poultry

Standard Weights of Turkeys.

VARIETY	Adult cock (2 years old or over)	Yearling cock (1 year old and less than 2)	Cockerel (less than 1 year old)	Hen (1 year old or over)	Pullet (less than 1 year old)
	Pounds	Pounds	Pounds	Pounds	Pounds
Bronze	36	33	25	20	16
Bourbon Red	30	25	20	18	12
Narragansett	30	25	20	18	12
White Holland	28	24	20	18	14
Black	27	22	18	18	12
Slate	27	22	18	18	12

NUMBER OF FEMALES TO ONE MALE.

The most important step in the raising of turkeys is the proper selection of the breeding stock.

Not more than fifteen turkey hens should be mated with one vigorous tom. If more than that is used it is advisable to have two toms and use one of them one day while the other is confined. The following day alternate the birds. Otherwise, the birds will be continually fighting and satisfactory results will not be obtained.

If a large number of turkeys is to be bred from and the turkeys are to be confined it is a good idea to have a lot for that purpose and you should have an acre of ground for every fifteen turkey hens. As many as forty-five hens can be kept in such an enclosure providing you have as many as three toms and alternate them each day. One tom being used every three days. The birds should be turned out late in the afternoon and allowed to range, but should be forced to come back to their quarters at night to roost.

BREEDING STOCK OF GREATEST IMPORTANCE.

One of the most successful turkey growers of the country made the following statement and we acquiesce in his views. They are so worthy of mention that we repeat them: "It is a law of nature that, 'like begets like.' Strong, vigorous, well developed parental stock transmits its strength and vigor to its offspring while the repeated selection of inferior birds for a number of generations make this inferiority hereditary. To breed from immature or poor specimens is to violate one of the first laws of breeding. * * * In selecting the male bird remember that he is one-half the flock. The most essential point is his vigor, then size, shape and plumage; in fact he should be as near perfection as possible. Select females having long deep bodies, broad backs and breasts and large shanks. While size must be considered I do not advocate the use of extreme heavy weights as breeders. Turkeys that weigh Standard weight when in good breeding condition are heavy enough and give better satisfaction, as the eggs will be better fertilized and the young birds more vigorous than if heavy weights had been mated."

NOTHING SUCCEEDS LIKE SUCCESS.

"There is no infallible guide or method to follow in raising turkeys. If you have a method by which you have been successful, that is the method for you—stick to it. Do not sacrifice common sense for method. To those who are unsuccessful, the best advice is to start right. Start with healthy, vigorus breeding stock and strive to improve it. Unless you have this solid foundation it is vain to hope for success. You cannot raise turkeys with the aid of a medicine bottle. Use common sense in the matter of feeding, give ample range to the growing stock, and you will find it a pleasure and not a hardship to raise turkeys."

SELECTION IS IMPORTANT.

The way we improve size, weight and markings is by selecting the finest marked toms with good bones and frame. Color with us is nothing, if the size is not there. We do not care for fat. It is not fat, but size we want With a fine marked tom of medium or good size, we mate with him some of the largest hens. The tom and hens must each have good shape. There are so many turkeys inferior in shape. The time has come, that the markets pay a better price for real choice turkeys than for inferior specimens. Many market buyers never bred a fancy turkey, but we would as soon risk their judgment in many cases on shape, size and color as the judgment of many poultry judges. That is saying big things, but they have made the market business a life-long study and handle more turkeys in one season than the average judge will in all his judging experience. They have found out the class that brings the most money in the best markets. The private trade demands the best. Hence, the time has come that the market business has merged into the fancy and the highest quality turkeys today bring the prime figure at market. Consequently, the mating and breeding for his quality should be carefully considered. We must get away from the old-time practice of using "any old thing just so it's a turkey."

As stated before, in the selection of birds for breeders, we have found several things to be considered and we believe foremost should be strength. We mean by that good, healthy, well-matured stock. Avoid inbreeding. We believe all good turkey raisers will agree with us in this. Color comes principally from the male bird. We use a medium size male with a brilliant bronze color, clear white edging. No real defect in markings, in fact, the very best colored bird we can get. One cannot afford to be careless in selecting the male bird. He constitutes one-half the entire flock. One, if forced to, can use a defective female. The eggs marked, poults can be marked and in that way tab kept on the offspring.

Now after we have this year's turkeys mated with a fine, and well-marked tom to large hens, that were possibly not as well marked as the tom, next season, we reverse the order and select hens medium in size but exceptionally fine in plumage and mate to a very large tom with as good plumage as possible, and we are almost certain to have just what we want in both males and females, the desirable size with fine plumage.

SELECTION OF THE FEMALES.

In selecting the females, we use birds with heads long and broad, a long body, yet full breast, a shank not short, yet not too long, well spread foot and long toes, a well poised head and bright, alert eyes, well barred wing, clear white penciling. The female is never so richly bronzed on fluff or lesser coverts, but we like to see plenty.

WHAT IS A DESIRABLE BREEDER?

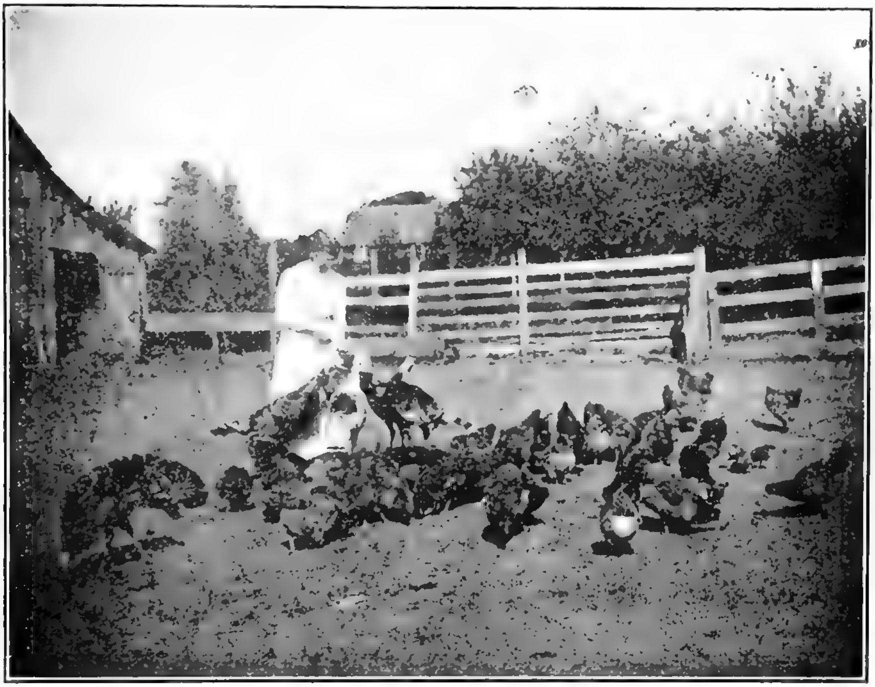
The following is our idea of a first-class turkey: Large, well-proportioned body; shanks medium in length, not too long, yet not what some would call "blocky," but rather lengthy, not gangling; with long, deep body; long, broad, well-arched back (no flat dished back birds find their way into our breeding pens) but a well-arched back is very desirable. You cannot get good shape nor large size from flat backed specimens. We want a full, round, deep breast, shanks large, feet large, head broad and large. Show us a turkey with a small snaky head, and you have a small, timid, wild, undesirable specimen every time. We want those that show a rich red about the head. We are aware that the head is changeable, but red should predominate. A domesticated turkey that presents a rather gray or blue head is never very vigorous and will not make a very good breeder, as a rule. Look well to the male for shape and color, and the females for size. We tolerate more imperfections with the females than in the males for the reason the male is at least half the flock. We mate from eight to ten females to one tom. This number is quite enough for best results. The females should not be younger than early pullets or yearlings. Never use late hatched females for breeders. We have used some late females as breeders with fair results, but as a rule they are not as satisfactory as older females. We prefer a well developed young tom to head our breeding pens, although we have had fine hatches from a tom five years of age. As a rule, however, the young toms, if well managed and from an early hatch, give best results for us. Now, as we have our matings complete, we will now look to the care of the eggs. Whatever you do, at least see that the breeding stock is fully matured.

MANAGEMENT OF LAYERS AND CARE OF THE EGGS.

The management of our laying turkeys and the care of the eggs is a very important matter. The care of the breeding turkeys should date back as far as December of the previous year. Too many overlook the fact that breeding turkeys are too often rendered worthless by being overfed. An overly fat turkey hen is a failure when it comes to furnishing fertile eggs or normal shaped eggs, hence every precaution should be used to prevent overly fat breeding stock. Early in December, we make our final selection of the breeders and place them in a large two-acre park we make especially for our breeding turkeys. We care for and feed them carefully and see that they are not overfed, and get every natural requirement, such as fresh water, sharp grit, charcoal and animal food.

FEEDING THE BREEDING STOCK.

We feed mostly wheat and hulled oats, with but very little corn. We possibly give a feed of corn once a week. We find we get better results by not feeding corn to the breeding stock. The animal food consists of beef livers, lungs and various kinds of meat scraps. Here is a very important feature of feeding breeding turkeys which is often overlooked. Animal food is the turkey's natural diet. In their natural wild state they live chiefly on insects and worms, with possibly only a small portion of their feed consisting of small wild seeds, etc. Since we have been feeding our breeders animal food, they lay better, begin laying at least two weeks earlier and their eggs are much more fertile. As the season approaches for them to mate, we feed more whole wheat and less meat, yet at the same time continue to feed the livers or any other animal food we have, such as dry beef scraps, but in a more limited way. We keep oyster shell and sharp grit before them continually and find they will consume a great quantity of this material. The more grit and oyster shell they consume, it seems the more eggs they will lay. We note when they discontinue eating these materials, they discontinue laying, so we are confident these materials are very necessary to egg production. They may not add much to the materials that go to make the eggs, but they assist nature in all the functions to complete the composition of the egg. Frequently, we feed ground bone, but prefer the pure meat, such as livers. This appears to satisfy them better than any animal food we have ever used.



Proper methods of handling turkeys and kind treatment will cause them to become very tame, but care must be taken not to overfeed and cause them to become fat. No farm that affords plenty of range is complete without turkeys. They should not be fed with chickens.

The breeding stock should be kept in good flesh, but not fat. If they are confined to small quarters during the breeding season they must be provided with an abunadnce of green food, and kept supplied with water, grit, etc. The natural feed of the turkey is largely of grass, tender sprouts, insects, worms, seeds, nuts and young leaves. If you confine your turkeys it is necessary to provide foods that will act as a suitable substitute for the above natural feed. Corn, wheat and oats are the best grains to be used and vegetables, such as cabbage, beets, lettuce, turnips and potatoes, may be supplied. Meat food must be provided by either furnishing boiled beef livers or a small quantity of meat scraps and if possible provide skimmed milk, either sweet or sour. Give grit, oyster shell and charcoal. Do not feed a large quantity of corn unless you provide an abundance of green food and force the turkeys to take a great deal of exercise.

FERTILIZING THE EGGS.

When a tom treads a turkey hen and copulation has taken place, all the eggs laid by that hen during the entire season will be fertilized. The hen will lay a clutch of eggs and go to sitting, and if you break her up and she starts to lay again, the second clutch of eggs will be fertilized even though a male has not come in contact with the hen since the first of the season. We have seen farmers drive their turkey hens to a tom on a farm in the neighborhood and leave them there for a few days and then when they were taken home all the eggs laid by the hens the entire season were fertilized.

TURKEYS NEED RANGE.

We do not yard our turkeys, but give them range. During the nesting season they are tolled into an enclosure out in the orchard, inside of which is placed barrels, real brush piles and boxes, the front hidden by loose piles of brush. China eggs are placed in the thus improvised hiding places. The turkeys are kept in a while and turned out each morning until after the nests are selected and three or four eggs laid. Then they are allowed to come and go at will. Sometimes Madame Turk takes the side of contrariness and has to be kept in all day for a few days, but seldom after having laid three or four eggs do they try to change nests. Use discretion in gathering the eggs, leaving the nest much as you found it, always a nest egg.

TO PREVENT RANGING TOO FAR

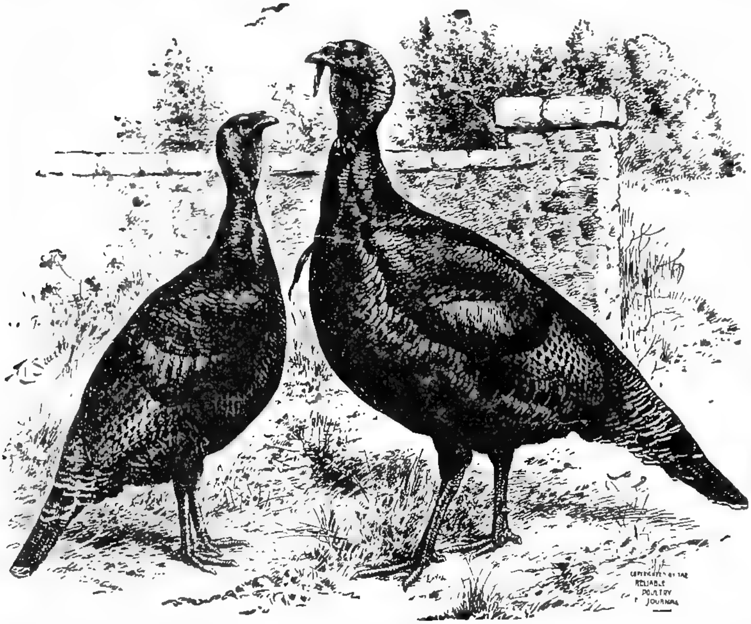
Very often trouble arises between neighboring farmers because a flock wanders over too wide an area and in some cases injures a nighbor's crop. If turkeys are fed heavily each morning and night this will help to prevent this to some extent, but perhaps a better way would be to confine the turkeys to a yard provided for them, which should contain about an acre of ground, and then release them from the yard about 2:00 or 3:00 o'clock in the afternoon. By feeding them in the pen each morning and again at night they will soon become accustomed to the practice of being confined. If they persist in flying out of the pen the flight feathers of one wing should be clipped.

NESTING PLACES FOR THE LAYERS.

About two weeks before they begin to lay, we place some apple barrels on their sides along the fence in a manner that will make the nest appear isolated. Fresuently, we cut brush and place over them and around them. This gives the nest a very secluded appearance and the turkeys will take to them without the least bit of trouble. Straw and leaves are placed in each barrel, but never place any nest eggs in the nest until they begin laying. We formerly placed the nest eggs in as soon as the nesting was completed, but found the turkeys preferred to make their nest away from where there appeared to be other fowls laying, so discarded the early "nest egg" until the turkeys begin laying and then place a nest egg in every nest where a turkey layed. We remove the turkey eggs each day.

The artificial eggs you buy on the market are the best, as they will almost invariably break the hen eggs, and this soon teaches them to eat their eggs, which is a very expensive and undesirable habit and at the same time it is hard to break them of the habit. We have trouble with our hens stealing their nests away and then losing a large portion of the eggs. It does not take long to build a wire fence around a two-acre plot. A five-foot fence is ample to keep the turkey confined and the space is sufficient for them to get exercise and find plenty of green food. We clip the feathers of one wing in order to make sure that some timid hen will not break over and escape prior to laying her first eggs. If a hen once gets over and lays her first egg outside the park, it is a hard matter to keep that hen in the park. If they lay their first eggs in the park, in the barrels prepared for them, they will never attempt to break over the fence. A field fence, 49 inches high with a barbed wire four or five inches from the wire on top, makes it very hard for the hens to get over when the wings are "clipped," but a timid hen will sometimes manage to get over.

As soon as the hens begin laying, we gather the eggs every day, as the weather as a rule is yet cool. In this latitude March 15th often finds us with our first turkey eggs, while some get eggs a few days earlier than this. However, it is too cool to leave eggs out at this date as the eggs will chill and are worthless for hatching purposes. As we gather the eggs we mark them and keep tab on every egg as to hen and date laid. In this way, we know just what each individual hen has done and can do. All eggs are placed in a basket and covered snugly with woolen goods so that they are not exposed to light or cold. The temperature of the room should not vary much from 50 to 60 degrees for best results at hatching time. The eggs are turned once every day and care is taken that grease of any kind does not come in contact with the eggs. Grease will destroy the hatch. If we notice a soft-shelled egg, we look well to the condition of the breeders. If they are receiving plenty of grit, shell and charcoal, with all the fresh water they want, then we know the hens are becoming too fat and cut down the rations until the eggs become normal again. If you get your hens too fat, you will soon notice thin-shelled eggs, eggs that are inferior in shape, and a prompt correction in the feeding should be made.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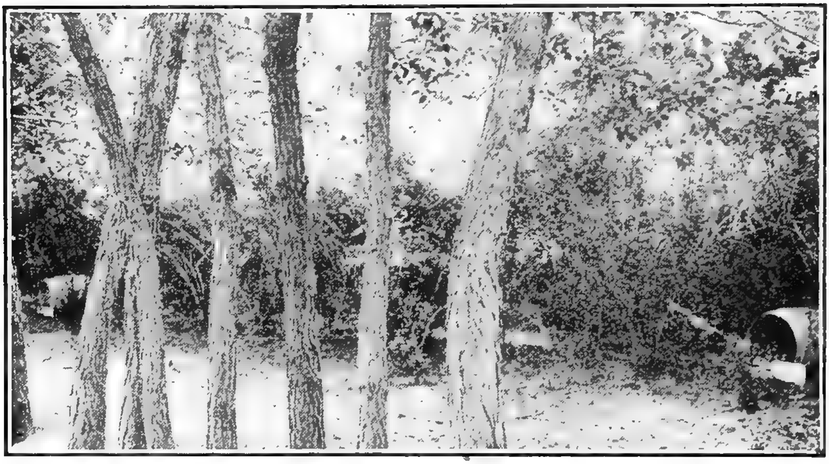
A pair of Mammoth Bronze Turkeys, "ideal" in size, shape and color.

PROVIDE NESTS BEFORE LAYING.

It is an easy matter for a turkey grower to have his turkeys lay close to the residence or in some convenient spot about the farm. If the turkeys lay their eggs in secluded spots where their nests cannot be located it is the poultryman's fault. Early in the spring before the laying season begins it is wise to take barrels and make nests in convenient places, which are rather secluded and where the barrels and nests will be protected from view to some extent.

The barrel can be turned down upon its side and a six-inch board nailed in front of the lower portion so as to hold the straw and nesting material. Several of these barrels can be placed about the farm where the turkeys are in the habit of ranging and can be covered over with brush, or the barrels may be placed in a thicket or underneath shrubbery. About four inches of earth should be placed in the barrel on which the nest is made. Sticks should be driven into the ground on each side of the barrel when it is lying on its side. This will prevent it rolling or blowing away. A nest egg can be used to induce them to start laying in these barrels. It is not necessary to use turkey eggs as nest eggs. Any large round shelled hen egg will do. If this method is used to induce the turkey hens to lay in nests that have been provided for them it is not necessary to yard your breeding stock in small pens. It is best not to do that if you can avoid it.

By following your turkey hens when they begin their search for a nesting place in early spring you can easily locate the place in which they have hidden their nest. In case this is done it is best to follow a considerable distance behind the hen and to keep from view as much as possible. When the nest is once located it is no trouble to gather the eggs from that time on.



Barrels should be placed in the shrubbery, brush, weeds or hiding places convenient to the premises. If this is done, most of the turkey hens will select one of the barrels in which to lay her eggs. They also make a good place in which to set the hens when they become broody.

If you have any trouble locating the nest I would advise confining the turkeys in a small pen until about 2:00 or 3:00 o'clock in the afternoon. Then release them and those which are laying will head straight for their nests.

GATHERING THE EGGS

It is usually advisable to take the fresh laid turkey egg from the nest each day and leave the nest egg in its place. If this is not done, crows, dogs, skunks or other enemies of the turkey may destroy the eggs. When this is done the turkey hen usually leaves the nest and finds a new nesting place.

The eggs should be kept in a cool room and should not be held longer than ten days or two weeks before being incubated.

SETTING THE HENS AND HATCHING THE EGGS.

We seldom set the turkey hens. One reason is we find if they are not tired from long sitting they are more attentive to their young; another they are large and sure to break eggs if disturbed in the least. We always raise the poults with a turkey mother. We set the eggs about April 15th under chicken hens. They cover ten easily. We always put soil in the nest boxes several inches deep, placing the nesting material on top. Have the hens rid of lice by use of some good powder. A few days before hatching, we take all litter from the nest, putting in fresh. Dust the hen, throw her out to rid her of the powder. Meanwhile the turkey hen has been setting for a week or perhaps three or four days. We place a few pipped eggs under her at night and leave her alone until she comes off with the two or three

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than any other fowl. They are perhaps the greatest brooders and natural mothers we have. We have had turkey hens, after sitting only three days, become the very best mothers. We have a three-year-old hen which brooded 31 fine poults and only remained on the nest two nights as a broody turkey hen. She was so gentle and quiet we gave her five little newly hatched poults at night and she at once showed contentment and great satisfaction in being able to brood a clutch of poults. We gave her 31, which is just six more than we usually give a hen. We watch the chicken hens carefully and when the poults are all hatched, and as soon as they are dry, we take them away from the nest and place in a basket, lined with a woolen cloth and place in a warm room. At night, we take them out and place with the turkey hen, which soon calls them to her and invites them under welcome wings. The poults are not long in taking up the language of their natural mother. We never have any trouble in growing turkeys with the natural mother, but when we attempt to grow them with the chicken hens, they soon diminish and we cannot have much success with that method.

FOOD AND MANAGEMENT OF YOUNG TURKEYS ON EITHER LARGE OR LIMITED RANGE.

Here comes the most important part of turkey raising. It is one thing to hatch a fine bunch of turkeys, but quite another thing to feed and raise them. We have discovered that thousands of young turkeys are killed by over-feeding, especially is this true where turkeys are grown on limited range. The same may be said of those grown on unlimited range as the poults on large farms receive ample food from range and are again fed or overfed by the attendant, and the results are indigestion and death. We feed our turkeys the least of any fowl grown on the farm. They always come home at night with a packed crop, filled with insects and the grasses which they relish most. They live and do much better on insect life than on artificial food or grains. During the berry season, turkeys enjoy this and nothing appeals to them more than a patch of berries. We never raised finer turkeys than five years ago when wild berries were plentiful during June, July and August. The world appeared to be alive with grass hoppers and all nature appeared to be in favor of the turkeys. That year, we never fed a thing after the young were started, and the turkeys made great size and developed the finest plumage. Some seasons it appears we are compelled to feed more than others. Avoid sloppy, sour or moulded foods by all means.

FEEDING THE POULTS.

We feed first about noon (they are now forty-eight hours old) a little stale light bread dipped in sweet milk, pressed dry, sprinkled lightly with black pepper, not too much, scattered around on the sand. Feed about five times each day for two or three days. If the weather is clear, we open a gap in the pen on the third day about nine or ten o'clock and let Mother Turk come out with her brood, which she will do very leisurely. Always keep her well fed on whole corn and do not allow her to range far. As they grow older, commence to feed a little hard boiled egg, a little onion top or lettuce leaves cut fine, but the main feed should be bread and milk until after two weeks old, at no time feeding all they will eat. Usually feed about half what you really think they need. The hen is driven back to the run about five o'clock and kept in until after the dew is off the grass in the morning. The boards are thrown back from top of pen to allow sunshine each day and every five or six days the run is moved over to fresh ground. After eight weeks old they are allowed to roost out of runs unless stormy. Several feed the poults after that age, but they usually will not eat if you do. They are well filled after their day's gleaning of bugs and worms. Keep plenty of cool, clear water for them to drink. We find the main trouble with raising turkeys is, we forget they are **not** a chicken. The culture is very different. Turkey habits are wild. Give them freedom. Do not pamper.

Some use a V-shaped brood pen with coop at small end, to keep poults and hen in on rainy days, and until dew goes off in mornings, and try to have them in or near the pens by five o'clock each evening. If allowed to stay out before the poults are large enough to fly up to roost, enemies may destroy the flock.

Another good method of feeding turkeys is to give their first feed in brood pens (after they are thirty-six hours old) of good corn bread, fresh cottage cheese and hard boiled egg (chopped very fine), mix all together, and dust with black pepper. Do not give more than a heaping teaspoonful to fifteen poults, five times daily. After the first three days, begin to very slowly increase the amount of feed, and chop up onion tops, dandelion and lettuce leaves, with scissors, mixing this and a good brand of chick feed with other feed. Do not fail to give plenty of the green feeds named above, as they are the best health preservatives we ever used for turkeys. Give the poults sand and oyster shell, also plenty of fresh water in drinking fountains or a saucer with an inverted tomato can in it to keep them out of the water, as dampness is fatal to the poults.

Feeding time. Turkeys require but little feeding. They do better if required to range for most of their food and allowed to make their selection.

As the weather gets warm, keep the poults anxious for food and they will range more earnestly for food, if it is possible for them to range. If young turkeys are fed anything like what they will eat up clean, they will soon contract bowel trouble and death is most certain to claim a large per cent of them.

FEEDING THE YOUNG POULTS.

Different turkey raisers use different methods. Very few of them feed exactly alike. Some of the more successful methods recommended are as follows:

1. One hard boiled egg for every eight poults added to stale (but not sour) wheat bread dipped in hot milk and squeezed very dry. Crumble egg, including shell, and bread together and season with black pepper sparingly. Feed this for two weeks or more, alternating the egg with cottage cheese or clabbered milk. After two weeks, replace the egg with best grade of beef scrap, and keep clabbered milk before them all the time; but if they can find insects and seeds on the range feed only the milk after the third week. When beef scrap is fed, it must be absolutely fresh and sweet. Sift and use only the finer portion.

2. One raw egg for every eight poults added to a pint of bran and enough clabbered milk to mix rather dry. For the first fourteen days feed on a clean shingle once in two hours all they will clean up eagerly. Use

pepper or ginger only in case of sickness. After the fourteenth day gradually replace the bran, etc., by chick food, using care that it is not mouldy or musty or tainted in any way.

3. Fresh, dry, steel-cut oat meal alternated with stale bread dipped in sweet milk and squeezed very dry, then mixed with hard boiled egg. After two weeks replace the steel-cut oat meal by finely cracked wheat and finally by whole wheat. In place of the egg well-cooked, finely chopped liver or lean meat may be fed occasionally.

4. Hard-boiled egg chopped fine and corn-bread crumbs for the first week, and then whole wheat and hulled oats.

5. Stale bread, soaked in milk and squeezed dry, for the first few days, and then common chick feed.

6. Clabbered milk seasoned with salt and pepper, corn-bread crumbs.

7. Equal parts "pinhead" oats, whole wheat, and cracked corn.

8. Cracked wheat.

9. Corn meal and wheat bran mixed in the proportion of 3 to 1 and baked into bread.

10. Bran or middlings one-half, cracked Egytpian corn one-quarter, wheat and hulled oats one-quarter.

With any of the above methods of feeding it is also a good idea to use skimmed milk or butter milk. Both kinds should not be fed at the same time. Neither should the sweet and sour milk be alternated. If you are going to use sweet milk continue to use that throughout the season. The same is true in case you feed sour milk. It is a very good idea to feed the milk in the morning and give water in the afternoon. Chopped onion tops, lettuce leaves, dandelion leaves, alfalfa or clover make excellent green food. Very coarse sand should be used as grit. Provide granulated charcoal. Cottage cheese, boiled wheat or rice are excellent for the young poults.

HELEN DOW WHITTAKER'S FEEDING SUGGESTION.

1. Do not change from one ration to another. Select your method of feeding and stick to it.

2. Feed very little, always leaving the poults a little hungry.

3. Feed often; the first ten days once in two hours.

4. Give no sloppy food.

5. In a natural state young turkeys live upon flies, spiders, grasshoppers, grubs, snails, worms, eggs, etc., together with seeds and berries. Little turkeys need more animal food than little chicks and hard boiled egg and milk are the best substitutes for flies, bugs, etc.

6. Dry corn meal will swell in their crops, ferment, and kill them. Use cracked corn and corn meal sparingly while poults are young and always scald before feeding.

7. Remember you must build a large frame, big organs, much muscle, heavy plumage; therefore feed builders, not fats.

8. As soon as the poults jump over 12-inch boards allow them range. They need exercise to have healthy livers, but never allow them to range over ground on which many chickens have run.

9. When the poults begin to droop under the direct rays of a warm sun. shade must be provided.

10. Lice, dampness, filth, and over-feeding kill most of the poults that fail to live.

PROPER FEED AND CARE FOR HALF GROWN TURKEYS.

After your turkeys are past the age of six weeks or two motnhs, if the proper methods are employed, you should experience no great trouble from that time on. It might be well for you to give some consideration to the recommendations of successful growers in reply to the following questions:

How do you care for and feed them during the period when about half grown, the time when first evidence of approaching maturity is shown? Do you consider this a critical period requiring special care?

"If grasshoppers are plentiful they get their own living and it is best for them. On these grass farms insects are plentiful. Developing the red does not seem to be a critical time here." Huguenot Poultry Yards.

"Allow them free range, do not feed anything, as they will find plenty of insects. If treated in this way they have no crtical periods." A. J. Kreutter.

"As soon as large enough give absolutely free range and they will do better than in any other way." Mrs. U. R. Fishel.

"Watch the young closely at all times, especially when half grown, which is a critical time. A large number succumb to blackhead or turkey cholera at that time. Do not feed corn until fattening time." Shepard Bros.

"Not if properly cared for and kept out of grain that is ripening. Allow them grit to aid digestion. Grain of any kind that is 'in the milk' is bad for a young turkey." Geo. Wolf.

"We give them the range of the stubble fields and they look after themselves. Plenty of grit must be furnished at this tim.e" A. E. Blaker.

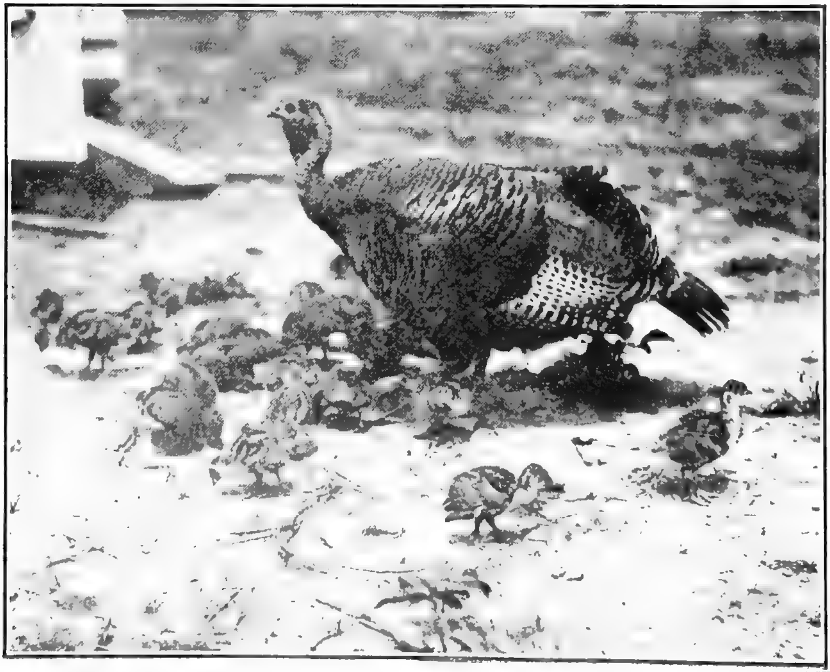
"No. By this time they are feasting on wheat and grasshoppers and will hardly eat anything you offer them. I teach my turkeys to eat whole corn just as soon as they will take it and give them some every day." Jennie Ferry.

"A little cracked corn, wheat and oats is fed; as they approach maturity, whole corn will do, but too much corn is not good for them. I have not found this a critical time." J. D. McClintic.

"Free range and a little food at night. They will be gone in the morning before you are out of bed. If they have pelnty of range and a turkey mother, they will need no feed at night. When they get their beads and new feathers, I think the critical period is passed." S. M. Price.

"We get the best results from letting our turkeys care for themselves from the time they are turned loose at two weeks old until they return to the buildings in the late fall. We do not see them for weeks at a time." Mrs. L. J. Mullock.

"This is a bad time for turkeys if the weather is cold and wet for any length of time. We drive the turkeys up at evening and feed them cracked corn and wheat sparingly. They soon get used to this and come up after a few nights without further trouble." H. W. Fairall.



A turkey hen is a better mother to young poults than a chicken hen.

PROVIDE FOR RANGE.

By all means, give your turkeys free range, otherwise, you will have more or less trouble. Turkeys cannot be confined but for a limited time, so if you cannot give them any range at all, you had just as well give up the idea of growing turkeys. However, if you have a limited range and can give your turkeys, say, half the range they usually require, it will be a wise plan to provide plenty of grit and charcoal for their use, as turkeys possibly consume more grit than almost any other fowl. Young turkeys cannot stand close confinement. If you confine turkeys, you are compelled to feed something that will take the place of insects and animal food and we know of no other artificial food that will fill these requirements as fully as clabbered milk or cheese, but it must be fed very sparingly.

BROODING YOUNG TURKEYS.

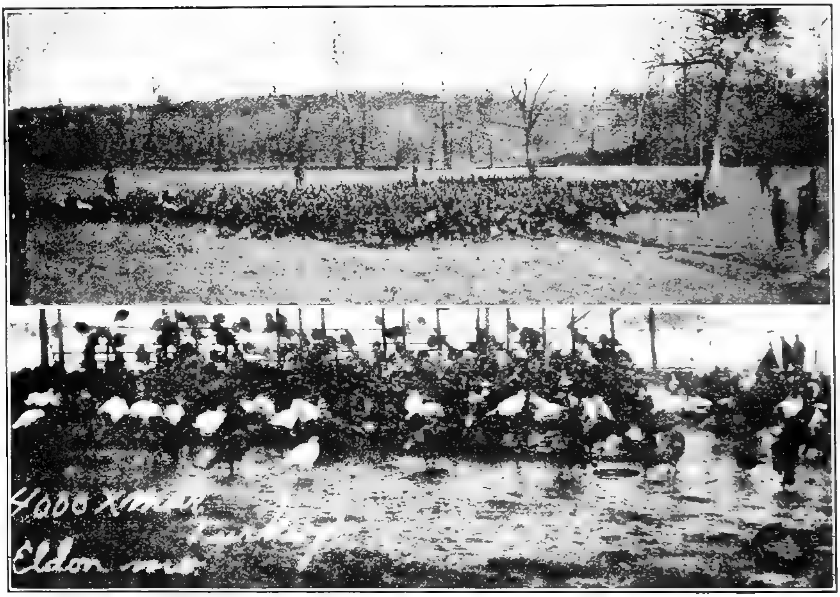
Never place the turkey hen in a coop in order to keep turkeys confined, but let the mother turkey run at will and use some twelve or fourteen-inch boards fourteen feet in length and make a square pen for them to run in and let the hen remain free as she will always remain close to the turkeys. It would be almost impossible to drive her from them. Keep the poults in this enclosure for a few days, when they can be released. Give them all the range possible and feed just as little as possible. Should your poults contract bowel trouble, decrease the feed and feed a small feed of boiled rice, to which has been added black pepper enough to make the rice take on a light gray color. If possible, feed the turkeys as much natural food as you can get, such as meat scraps and green foods. If you can give the poults free range with a good turkey mother and never feed at all, they will be much better off. The turkey is naturally a wild fowl. This wild nature of feeding on insects and worms will never be bred out of them, and the more we can give them the privilege of using this wild habit in procuring their food and the less artificial food, the more turkeys and better specimens we can raise. The best and largest flocks which are produced are brooded with turkey hens and allowed to range over the fields for food. One of the best flocks we ever saw was raised without a mouthful of food being given them.

LICE ARE DEATH TO TURKEYS.

Lice is the worst thing to contend with in growing turkeys. Some seasons they are worse than others, we find. If the weather is a little damp it is very hard to keep the turkeys free from lice, but if the weather should be dry, then the dusting of the poults in the fields or road will almost keep them free from lice. We use and recommend London Purple on the turkey mothers for lice on both old and the young poults. At night ruffle up the feathers of the mother on her back and fluff and carefully sprinkle the poison on the fluffy feathers of the back, and no more lice will appear until time takes all the strength away. We use the treatment every week and are not bothered with lice. Remember, that this medicine is very poisonous and will kill the poults as quickly as the lice should you use too much or get any of the poison on the ground or feeding boards where the poults would come in contact with the poison. The London Purple, if used with precaution and good judgment, will never result in disaster and death to the poults, but will save them and kill every louse. The turkeys grow off nicer and make much better growth when free from lice. We find that the majority of poults that die are fed to death or killed by lice, hence, do not overfeed, and free the hens of lice by using London Purple in a judicious manner. Remember to use this sparingly or else you will more than likely kill every poult.

FALL FEEDING AND CARE OF TURKEYS.

As all turkeys grown are not for breeding purposes, we must get the turkeys we expect to market in prime condition prior to the Thanksgiving markets. Thanksgiving usually gives us the best markets. While this is true as a rule, yet sometimes Christmas gives us the best market. However, as we cannot foresee the future, it would be best to get the turkeys in prime condition in time for the Thanksgiving market, then if the market is looking favorable a few days before the market closes for the Thanksgiving trade, we crowd the turkeys to the utmost in order to have them as fat as possible. It is the excessive fat which makes you money. If we see the market for Thanksgiving is going to be overdone, we discontinue the heavy feeding and tide the turkeys over until the Christmas market opens, then feed all they will eat for about ten days before selling them. Ten days is just about as long as we could ever feed turkeys heavily. Longer periods than that result in bowel trouble and death. Some feeders claim turkeys "get ripe" and then you must sell or they will go down, lose in flesh and vitality. There is more truth than fiction in this statement, as a turkey is very tender and cannot stand any great amount of over fat any great length of time. We begin feeding the young turkeys for market in a mild way about the first of October. At this time we feed both morning and night, but never more than they will clean up quickly. We would rather a turkey would go out for the day's ramble hungry, than to have it over fed. Some of the most successful turkey growers claim that the reason we have and hear of so much bowel trouble and "Black Head" in the fall is because we feed too much, or the turkeys get too much green corn which has been blown down. Generally, the latter is responsible for the majority of deaths.



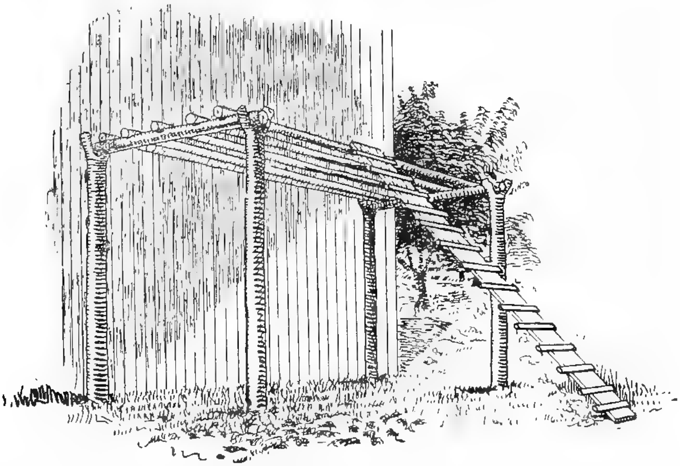
Four thousand turkeys being driven to market. This shows the extent of turkey growing in some sections.

When we first begin to feed our turkeys, we try to use a little common sense and feed lightly for at least ten days, or until the turkeys have become accustomed to heavy feeding, and then we gradually increase the food until we have them on full feed. Our first feeding consists of heavy oats and wheat, gradually merging into corn as the weather gets colder, as too much corn, while the weather is yet warm, proved destructive to turkeys. After the weather becomes cold, we feed largely on corn. Old corn should be used in every instance as new corn has a tendency to produce bowel trouble and when fed exclusively will result in severe liver trouble, killing in some cases practically every turkey. We have known whole flocks being ruined by the owner being too anxious to have his turkeys plump and fat at Thanksgiving. If you will feed small grains as a starter and gradually merge into feeding old corn, and alternate with your smaller grains, you will have your turkeys in prime condition by Thanksgiving. We use a great amount of charcoal for our turkeys, and you would be surprised at the amount they will eat during a season. We find it is one of the greatest things to aid digestion ever fed a turkey. They like it and will eat of it freely. They are not bothered so much with bowel trouble when charcoal is used freely. Many people will and do advocate penning turkeys in a close pen when feeding begins, but a greater mistake could never be made, in our opinion. We have given this method of feeding a fair trial, time after time, and under every favorable condition, and find it a complete failure in practically every case. Give your feeders all the range they wish and you will find they will do much better, fatten faster and escape the severe slump in weight which is sure to come when you pen them to feed. Many people, to our personal knowledge, have fed their turkeys for weeks in close confinement and the turkeys gradually lost weight every day and they could not understand the cause. Whenever we attempted to feed turkeys in confinement they would refuse to eat, soon show signs of bowel trouble or other digestive derangements, and the whole flock would decrease in weight and vitality. We find that in the fall, when the weather is cold or cool, the turkeys will eat freely of morning and then range around a few yards from the building and search for grit and other little choice morsels of food to add variety and to make their food digest well, then come back to some building for a windbreak, and sit down contented until the middle of the evening, when they will take another ramble in search of green food, grits, etc. All this goes a long way towards paving the way for perfect health and adds fat faster than when you attempt to confine them. We have seen some few try penning and feeding and have good results, but where one will escape, hundreds will fall victim to the many fatal ills that go with yard feeding.

ROOSTING SHEDS FOR TURKEYS.

Expensive housing for turkeys is not required as is true with some varieties of poultry, but it is advisable to provide a shelter to protect them from the rain and wind. A shed may be built ten fee square or larger if required. Posts, which are nine feet long, may be sunk in the ground and then made level and square cut at the top. The distance from the ground to the top of the posts should be about eight feet.

On these posts should be built a double pitch roof with gable ends, the roof slanting in two directions. The rafters should be covered so as to make the roof rain and wind proof, and a space about two feet below the eaves of the house should be boarded up. The gable ends of the shed should also be boarded down from the roof to within six feet of the ground. This would then leave an open space entirely surrounding the house, six feet in width. Five roost poles can then be provided in this upper boarded section



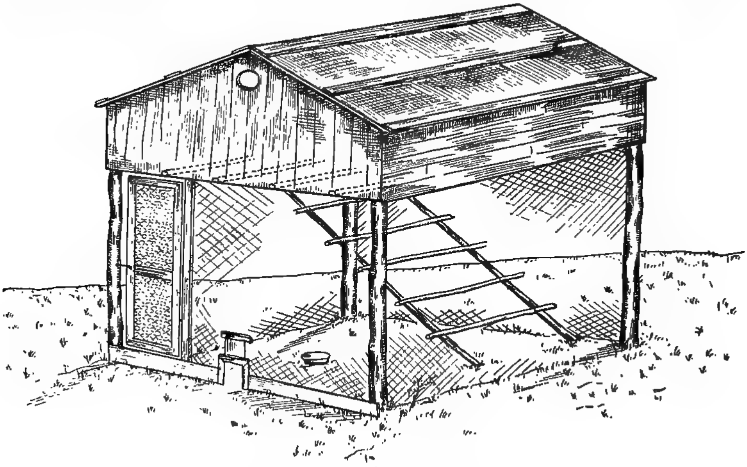
Turkeys should be required to roost on the fence, in the trees, or in an outside roosting place built against a barn or building, similar to the above illustration.

of the shed which should run the entire length of the house and be spaced about two feet apart. In the center of the house, running from the ground to the roost poles, should be a ladder about four feet wide and made from cut poles, the poles being placed one, two, three, four and five feet from the ground. This enables the birds to reach the upper roosts without any difficulty whatever. A large door should be built in one end of the house so as to admit the attendant and also a door about two feet square should be made as an exit for the turkeys. The space between the poles, which is not boarded up, should be covered with poultry netting.

When the severe cold and damp weather of the fall months begins, it is advisable to entice the growing turkeys to this enclosure and they can be confined there for a day or two until they learn to take the roosts. Following that they will usually come to this place each night. If they do not return voluntarily they can be driven back to roost, and in that case it is usually best to give them their evening meal on the inside of the enclosure. Their evening meal should always be given either in or near this roosting shed. Even the young turkeys with the mother hen may be trained to take to this roosting shed when quite young.

NO HOUSING REQUIRED BUT WINDBREAKS ARE BENEFICIAL.

The turkeys that are intended for breeders should have range every day and allowed to roost outside at night except when the weather is very severe. Many seem to suppose that turkeys reqire shelter at night the same as chickens, but such is not the case. The healthiest turkeys are allowed to roost out in the trees, away from buildings. We seldom find a turkey with roup, when they are allowed to use the trees for roosting places. The colder the night, the higher they go. If you wish to introduce roup in your turkeys, just let them roost in the hen house a few nights and you will soon find them suffering with some form of roup of which there are many. If a turkey can shelter out of the wind it can stand almost any kind of weather. We notice our turkeys as soon as the wind begins to blow severely, will hunt for shelter around the buildings, but not until then do we attempt to give the turkeys shelter in the buildings. If the weather continues cold and windy, we drive them in the houses and allow them a comfortable place until the blizzard is over. Cold does not affect the turkeys, but wind is undesirable it seems. Healthy turkeys can only be obtained by careful management. They will tell you in a way what they will require, if you study their requirements daily. The turkey is a fowl which is easily grown and with but little expense if you mange them properly.



A shed or roosting quarters which should be built for turkeys. See text for further description of the roosting shed.

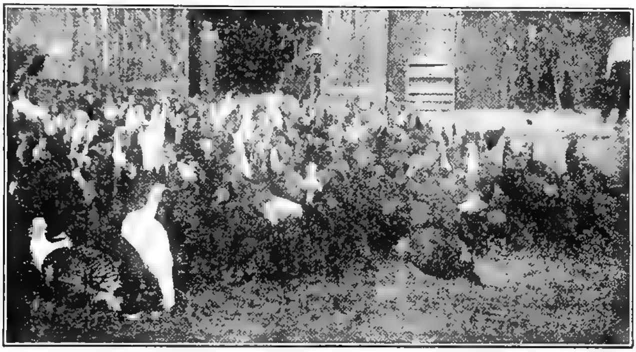
To house turkeys continually usually results in stunted turkeys. They are a fowl which require a great amount of fresh air. The more fresh air the turkeys get the healthier they will be.

DISEASES OF TURKEYS AND THE PROPER LOCATION FOR THEM.

Our experience with turkeys has been that diseases seldom ever appear except through impaired digestion or by inbreeding or because of weakened vitliaty caused by lice. Inbreeding possibly is the result of more diseased turkeys indirectly than almost any other one cause. If your turkeys become temporarily sick you can build up the constitution and remove the cause of the trouble and cure many of the complaints. Where the turkeys have become thoroughly broken down by constant inbreeding, you cannot do much for them. You had almost as well use the ax on all those that show low vitality and general weakness. Procure new blood at least every second year, birds that you are positive are not close kin to your present flock and you will escape many of the troubles turkeys fall heir to.

KEEP TURKEYS IN SMALL FLOCKS.

Do not attempt to keep many turkeys in one flock. We never attempt to grow more than seventy-five to one hundred head on one farm. You can handle a small flock much better than a large one. If you wish to grow larger numbers, farm some of your eggs or stock out and get some of your neighbors to grow a flock under your own direction. Large flocks of 500 or more are grown in the West, where the country is new, but in the old settled sections where the land is new, free from any disease, they can be grown there in great numbers. They can be grown here, more easily on large farms where there have never been turkeys grown, but where turkeys are grown year after year, you will notice the number of poults will diminish with each succeeding season, unless every precaution is taken. We would not advise attempting over seventy-five or a hundred a season, and you will usually have less disease, less trouble and more profit.



Hundreds of turkeys raised in one community by a number of farmers being driven to market in one common flock.

PREVENTING COLDS.

Colds often develop in a flock that is housed every night, regardless of the weather. When the poults are allowed to roost out in the open, colds and roup seldom appear, unless the place has become diseased by chickens having the roup.

WHAT CAUSES SO-CALLED "BLACK HEAD."

The so-called "Black Head" of which you have heard so much is conceded by some of the best turkey breeders to be simply **"impaired digestion,"** brought about by heavy feeding. Examine a flock of turkeys that are heavily fed on fat-producing foods, or allowed to range in the "down" corn, and eat freely of unmatured corn in the fall, and you usually find a flock suffering with so-called "Black Head." You will seldom ever find a flock of turkeys suffering with any form of bowel trouble that were allowed to pick up their living from range and not fed fat-producing foods or allowed to eat freely of corn, green or dry. Corn is very fattening and will fatten a turkey quickly, and as soon as a turkey is well fattened, if it is not marketed and is retained and continued to be fed, it will soon show signs of disease and death is certain.

PREVENTION OF BLACK HEAD.

We think the best method of preventing this disease is to keep the turkeys on fresh sod and to give them an abundance of free range. They should be kept out of corn fields when the corn is just in the milk or not matured and they should also be kept out of oat stubble or oat fields.

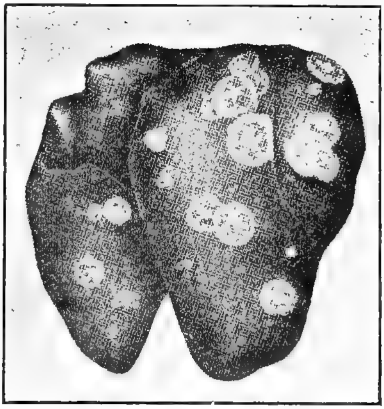
If a poultry man recognizes this disease he should immediately isolate all affected birds. The great danger lies in the fact that turkeys so affected have as a rule been spreading the germ through their droppings and these germs may have been carried about the premises on the feet of careless poultrymen or by rats, sparrows or other birds or animals that may have visited the infected yards.

Sick birds should be kept on a board floor and droppings covered with lime and removed and buried. All dead birds should be destroyed by burning the carcass. All yards and feeding places should be covered with air slacked lime and then the soil plowed or cultivated.

TREATMENT OF BLACK HEAD.

Thus far no successful treatment has been discovered. If the affected birds are to be kept they should be confined to a dry, comfortable place and given soft foods consisting principally of bread soaked in milk, boiled wheat or rice.

It is said that the parasites of this disease are found in turkeys that are apparently healthy and the only difference between the healthy bird and the sick individual is that the parasites are not numerous in the first case and do not appear to any marked extent in the tissues, while in the diseased birds the parasites are present in such great numbers that a bird is not able to throw them off and death follows. The reason that the parasites get a foot hold and tissues break down in one case and not in another is perhaps due more to the feeding than any other one cause.



Liver of turkey with Black Head, showing diseased areas. (Modified from Moore.)

Either the method of caring for or feeding or some other cause has brought about the condition of the intestinal tract, which is favorable to the parasites and caused them to develop and invade the tissues in great numbers, while in the healthy turkey the parasites have been held in subjection because the normal intestines have been antagonistic to their development. The avoiding of the parasites does not make the disease impossible. Giving the birds doses of intestinal antiseptics will not eliminate the parasites to any great extent. The big problem is to so feed and care for your turkeys and keep them under such favorable conditions that the parasites are restricted in their development. Those who know how to feed their turkeys successfully and how to best care for them are the ones who are able to avoid this dreaded disease.

POST-MORTEM APPEARANCE OF BLACK HEAD

The Kentucky Experiment Station states the following:

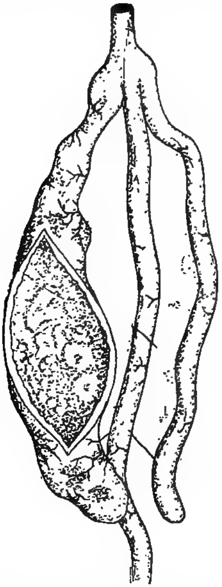
"It is important that an autopsy be made when black head is suspicioned. The absence of a dark purple color of the head is not a criterion to be relied upon. The liver and caeca should be examined because these two organs are primarily affected in black head. If the disease exists, marked changes from the normal will be easily recognized and preventive measures to check the spread of the disease to the healthy birds should be resorted to at once.

"The Caeca—The caeca are two in number and can be differentiated from the other parts of the intestines by their ending in blind pouches. They become enlarged in black head and sometimes the enlargement is extended the full length of the caeca; at other times the wall bulges in small areas and presents a yellowish, cheesy appearance from the outside. Normally the caeca are smooth and no larger in diameter than the branch of the intestine which lies between the caeca and opens in common at the base. If the contents are of a liquid nature, particles of yellowish material are frequently found afloat in the lumen. The wall of the caeca becomes thickened and in severe cases the inflammation extends to the outer covering, resulting in peritonitis and adhesion of the caeca to the adjoining tissue. This condition may be observed in the chronic form of the disease, rarely in the early stages of the more acute type.

"The Liver—The liver manifests marked pathological changes which can scarcely be overlooked. It is greatly enlarged, depending upon the extent of the infection, sometimes two or three times its normal size. From the discoloration of the liver the disease is sometimes known as "spotted liver." The spots vary in size, are of a yellowish green color, and present the appearance of concentric wings which is very characteristic of black head.

PREVENTION AND CONTROL

"The contagious nature of black head makes it necessary to employ prompt measures of isolation and segregation. Sick birds contaminate houses and runways and the immediate removal of healthy hens and poults



Portion of lower intestine of turkey, with Caeca. (Modified from Moore.) The caecum on the right is represented as normal, and that on the left, which is cut open to show the interior, is diseased. In the advanced stages of Black Head you will find the Caeca destroyed by the parasites and even the walls of the intestines adjoining will be partially destroyed.

to clean quarters is essential. Affected birds should be killed and cremated immediately, as they continue to intensify the existing infection. It is important that the healthy birds do not remain in the same house or come in contact with fowls of any age that have access to infected premises. A common mistake in the control of infectious diseases of poultry and other farm animals is the removal of the sick to isolated quarters, allowing the healthy animals to remain exposed to the infected premises.

"The houses, roosting places, and runways should be thoroughly cleansed. First remove all litter from the coops and houses and spray with lime water containing five per cent carbolic acid. The runways should be raked up and cleansed by scattering slaked lime on the ground surface. All litter, straw and refuse accumulated from cleaning should be burned.

"On farms where poultry range at large, thoroughly cleaned and disinfected quarters should be provided for the healthy flocks to insure against possible existing infection. Soft feeds should be fed, excluding corn as a part of the ration. In the chronic or slow form of the disease, sour milk should be supplied in liberal amounts. It must be given in the early stages of the disease to the infected as well as exposed birds, as otherwise it may not always exert a beneficial effect. When sour milk is not available it is advisable to provide a solution of muriatic acid in the drinking water. Various amounts of this acid have been used, but the proportion of one teaspoonful to one quart of water has proven unharmful and has been followed my the most favorable result. A porcelain or earthen container should be provided for this purpose. As before stated, chickens are not often affected, yet in the virulent form the disease may spread to chickens, resulting fatally. To avoid possible loss in fowls they must be protected from exposure and subsequent infection."

GOOD GENERAL TREATMENT FOR TURKEY AILMENTS.

When we have a turkey that shows signs of bowel trouble we promptly catch it and give it a dose of the following: Hypo-sulphite of sodium, 3 grains; sulphate of iron, 1 grain; sulphur, 10 grains; and sulphate of quinine, 1 grain. This treatment should be given every four and a half hours during the day until the turkey is improved. Then three times a day. Provide plenty of water for turkeys to drink at will, while you are giving this treatment. Avoid heavy feeding of grains. A light ration may be given of wheat or wheat bran and a small amount of corn meal mixed into a soft mash. Feed but very little and as soon as the turkey shows signs of activity turn it out on grass and it will soon become normal again.

BEST LOCATION FOR TURKEYS AND TREATMENT FOR ROUP.

Turkeys will always do best on hilly or rolling land. Swampy ground is unfit for turkeys as they cannot stand damp or wet weather or a swampy location of any kind. You can often overcome roup by cutting an incision just below the eye, where the nostrils swell and then press the mucous out thoroughly and wash the wound freely with water to which has been added a few drops of carbolic acid or creolin. We use equal parts creolin and water. After the wound is thoroughly cleaned, fill the opening with common table salt or powdered alum and you seldom have any more trouble with that case.

ANOTHER TREATMENT FOR LICE.

If you have never experienced lice on young turkeys, it is because you have never looked carefully for them. It is easy to overcome the lice proposition. If you are prejudiced against the use of London Purple for your poults, then drive them into some coop, house or pen so they may be easily, gently and quickly handled, and next seat yourself where you will be comfortable. Take up a poult and examine it and in the flight feathers and in between the web of feathers, you may find a large assembly of lice. Dip the end of your finger in a bit of lard which has been provided and rub in the web of the feathers of the wing. Spread it out carefully the entire width of the flight feathers. This will get every louse. Place a small drop just below the vent. Examine and treat the head the same way. Drop your treated turkey down, so that it can go to the mother. Reach your hand through the trap door of your box and catch another turkey and proceed as before. You can eliminate every louse very quickly, by using this method, and it saves giving the mother hen a fright and does not worry the turkeys. We treat our turkeys for lice every week. When we use lard or grease of any kind we are very careful to use but little, as grease will kill the turkeys as quickly as the lice if too much is used. We never use grease until the turkeys are three weeks of age as the treatmnt is often sure death to younger turkeys. When we use London Purple for lice, we sprinkle it in the plumage of the mother turkey, on the back directly below the fluffy feathers of the back. Great caution is used not to allow the poison to come in contact with their food, as this too is sure death to the turkeys if they get the least part of it in their crops. If you get too much on the hen, the poults will inhale too much and death is certain in that instance. Almost any poisonous remedy for lice is quite risky with turkeys, but if you are an experienced grower and have used these treatments you can successfully handle them. If you are an amateur, we would advise you to use lard for lice as it is not quite so dangerous. We prefer to use any louse eradicator at night as it will have a greater effect than when used in the day time. When you use the lard treatment see that the turkeys do not get wet, and are not exposed to the hot sun. Keep them in a shade where they can be comfortable as the grease on a hot day has a tendency to penetrate the skin too much and cause weakness, often death

KEEP YOUNG TURKEYS FROM OAT FIELDS.

We have lost a great many young turkeys and have seen entire flocks lost, where they were allowed to run or range in a field of oats. Either the immature oats themselves or something which the turkeys come in contact with in the oat fields cause them to become sick and die. It seems to have this effect on turkeys that are from one to four months old. You may give them the best of care and feed, but if they are allowed to range in an oat field, they will begin to droop and die.

TREATMENT OF TURKEY DISEASES.

In treating chicken pox, roup, limber neck or crop bound we would recommend about the same treatment, which has been recommended for the cure and prevention of these diseases in other varieties of poultry.

Turkeys should not be allowed to range over ground used by chickens or ducks and if given their liberty and provided with roosting places there is not much liability of the turkeys contracting any serious ailments after they are two months old. The two greatest dangers from that time on in my opinion are the fatal results from lice and the disease commonly known as black head.

Turkeys are generally conceded to be the most difficult to raise of all poultry. In their natural state they are healthy and hard, but in confinement they seem to become an easy prey to disease and the mortality in domesticated turkeys is often very great

A wooded pasture or an old sod is preferable to cultivated fields for ranging or yarding turkeys. If they are permitted to have same runs with chickens they easily contract the same diseases and the mortality in young turkeys is very great as a result.

TEN COMMANDMENTS FOR PREVENTION OF TURKEY DISEASES.

If turkeys have plenty of range on fresh ground, and sensible care, there is no reason why anyone should have great difficulty in raising them. Mrs. Helen Dow Whittaker is the author of ten commandments for the prevention of disease:

1. Never feed on the ground where food may be left to ferment, sour or mould, and later be eaten.
2. Never over-feed, especially of egg or mash. Remember that in a wild state turkeys are more often hungry than not.
3. After two weeks of age in good weather, let the hens take the poults and go. They do not need coddling, but they do need protection from weather, beasts of prey, etc.
4. Keep the poults and their coops free from lice. Use Persian insect powder to dust them or a drop of olive oil on the head, at the quill of the wing feathers, and around the vent.

5. For a tendency toward bowel trouble feed boiled rice. Bowel trouble indicates improper feeding or exposure to dampness, cold, or both.

6. Do not permit poults to run over ground which chickens, pigs, ducks, geese, etc., have made filthy. Plow up such ground or keep the poults yarded away from it.

7. When the poults have been chilled or seem droopy and need a tonic, make it as follows: Boil a pint of milk, put in it a shake of red pepper, add a tablespoonful of alcohol; then beat up a raw egg and add to the mixture. Use this to moisten the bran mash. A little finely chopped lean meat may be added.

8. Use greed food finely cut in quantity in all rations as an aid to digestion.

9. Be especially watchful of the poults when at about six weeks of age, they "shoot the red," that is, begin to grow the protuberances on the head and neck. The danger is of the blood flowing back upon the heart and becoming stagnant, the intestines become clogged and inflammation and diarrhea follow. The following treatment will prove helpful: Mix one tablespoonful of red pepper and two tablespoonfuls of wheat middlings with water and make into four pills—bake hard. Give one pill three times a day to a full grown turkey or a smaller one in proportion to size of fowl. Follow with a tablespoonful of castor oil for the old turkey or a teaspoonful for a young poult.

10. Call the turkeys home to roost by feeding them a little grain every night.

CAPONIZING TURKEYS.

The turkey male can be caponized but it has not been found necessary or so practical to do this in the case of turkeys as with chickens Caponizing, however, adds to the quality of the flesh of the male and the birds become much quieter and are more easily gotten into condition for the Thanksgiving market. The birds do not range over such a wide area. There is a trifle more danger in caponizing turkeys than there is in the case of chickens.

WHAT IS MOST CRITICAL AGE?

What is the most critical age for young turkeys and what special care should be given them at that time. It might be wise to let a dozen successful breeders answer this question for you, which they do as follows:

"From hatching time to about six or eight weeks old, and when about half grown. Keep them where it is dry, give dry food, grit, and water. If on range, let the hen alone." H. W. Fairall.

"From four weeks to two months. Feed to avoid liver trouble (if you know how, I don't) and keep lice off not allowing them out in drenching rains." Jennie Ferry.

"When the new grain is being harvested. Keep them away from it." Mrs. Laura Kunkle.

"When they are getting the red beads around their necks and their new tail feathers. They need at this time nourishing food. They should have mixed grain, plenty of grasshoppers and free range." S. M. Price.

"'Shooting the red' is the most critical age. We have no trouble with our turkeys on free ranges." Mrs. L. J. Mullock.

"When they begin to 'shoot the red.' If given free range and plenty of water to drink, are not overfed and kept free from lice, much sickness is avoided." Geo. Wolf.

"From the time they are hatched until they are three months old. Keep them free from lice." A. J. Kreutter.

"Some years ago, I considered that if a turkey lived six weeks or two months that he would live unless killed in some way. Now that black head is infecting this part of the country, one is never sure of them, as grown fowls sometimes die of this disease as well as young birds at any time from six weeks to maturity. I endeavor to keep their liver in good condition by the use of onion tops, garlic, watercress, lettuce, etc., and once in a while give them a mixed food of ground grains with sweet oil or olive oil in it as a laxative." Bertha M. Tyson.

"They are liable to bowel trouble at all times, but are less troubled with diseases during cold dry weather. Avoid over-feeding at all times." Shepard Bros.

"The first three days and from the sixth to the eighth week. First period, keep dry and quiet. Second period, keep free from lice and do not over-feed." A. E. Blaker.

QUESTIONS ON TURKEYS.

LESSON NO. 33.

1. What has been the decrease in the turkey crop of the United States in the past ten years?

2. Name three varieties of turkeys which appear to be most popular?

3. What are the advantages of keeping only one variety of turkeys?

4. Which two of the eight vital points mentioned at the beginning do you consider the most important? Why?

5. Which is of the most importance in turkeys, size or color? Why?

6. Which is of most importance, size or vigor? Why?

7. What method would you pursue in building up a flock in size, weight and color?

8. How many females should be mated to one tom? What is the proper age for breeding stock?

9. What care should we take or what danger is there in feeding the breeding stock?

10. What is the best method of feeding mature turkeys?

11. Should turkeys be confined or allowed free range? Why?

12. How should they be managed at breeding time for best results?

13. Describe the best method of incubating turkey eggs, just as you would do it?

14. What is the best method of brooding the poults?

15. How should the young turkeys be fed?

16. What is the most common fault in feeding poults?

17. What kind of vermin is death to young turkeys and how can you rid the turkeys of it?

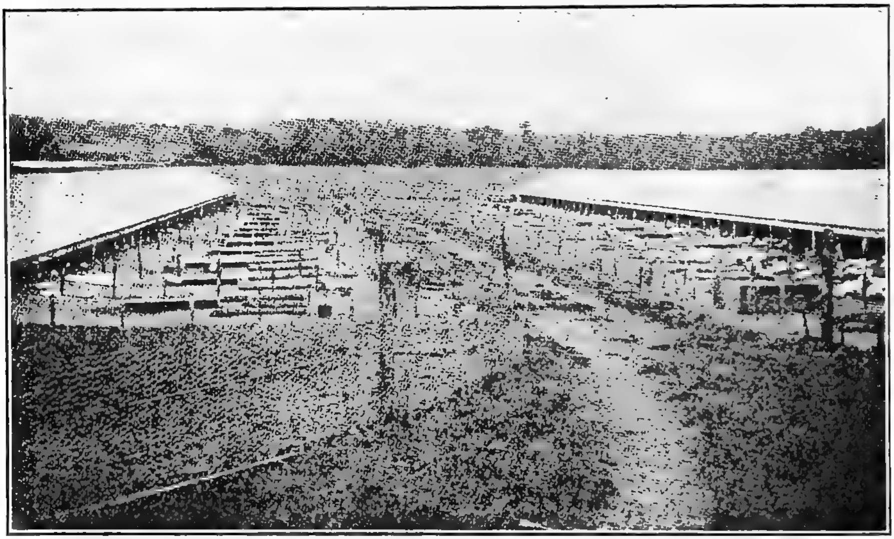
18. What sort of housing is required for turkeys?

19. How would you prevent and treat roup in turkeys?

20. Should young turkeys be allowed to range in oat fields?

THE DUCK INDUSTRY.

Possibly, there is no branch of the poultry industry that is gaining more favor with the average poultryman than the duck industry. Ducks have come to stay, as the intelligent poultryman fully realizes the great popularity and enormous demand of this branch of poultry keeping. When the American farmers generally learn that ducks are practically immune from diseases, and at the same time as remunerative as other fowls, ducks will become more and more popular. Ten years ago, the duck industry was not ever thought of seriously by many, but now they are raised by the hundreds. Strange, yet true, until the last few years, seldom was there anything about ducks mentioned in the poultry journals. Many good people really did not know the real value of ducks. Some had the impression that they were merely for pleasure, others thought they were kept only for feathers, while some supposed they were kept on the farm for a curiosity. There are many farms today without ducks.



The long sheds used on one of the country's largest duck farms. These sheds are built simply to protect the growing and fattening ducks from the sun, rain and storm. You will note the feeding troughs in the yards The fences are about two feet high. There is a roadway between the houses. A wagon, loaded with the feed, is driven down the roadway and the pens of ducks fed on each side.

There are few domesticated birds so free from disease or insect parasites as ducks if kept under reasonably sanitary conditions. Given health and vigor in the breeding stock, clean grassy runs and judicious care as to the food, there is no kind of poultry that will respond so quickly and profitably to good treatment. They are, however, equally susceptible to neglect, and failure to provide good quality food in variety or housing in damp filthy houses may result in heavy losses.

There has been much written of late years emphasizing the importance of fresh air in poultry raising. In housing ducks this is an absolute necessity. Cold will not affect them but the bad air of a closed house will invariably result disastrously, and wherever disease makes its appearance among ducks, the mortality is apt to be considerable. They require open front housing at all seasons.

To prevent disease, use only sturdy, vigorous, well-matured specimens for breeding. A healthy breeding duck possesses a certain amount of disease resisting ability and where this is combined with common sense judgment in care and feeding on the part of the breeder there will be very little tendency to disease.

Leg weakness, a common cause of trouble in ducklings is usually the result of a too highly concentrated food or from feeding such foods continuously. Over-feeding on rich food frequently induces lack of exercise and consequent digestive disturbances.

The duck has a natural capacity for getting pens and houses in a filthy condition. In a short time, unless care is used in removing left-over food or other filth, the houses and yards become sloppy and offensive. To avoid this condition, the water tanks should be cleaned daily, the feeding troughs scraped clean of left-over food before giving a fresh supply, the yards should receive frequent attention, raking them over occasionally and turning over the sod twice yearly, sowing to oats, rye, or other green stuff.

This is the best way of disinfecting the ground and at the same time supplies fresh food for young or old ducks. It is only by means of these precautions that healthy stock is maintained on large or small duck farms. It is impossible to conduct a successful business in duck growing without proper care and attention to such details.

Ducks having their morning swim. Water is not a necessity in raising the young stock but is of great benefit to breeding stock. It is not necessary to have any great body of water for them even. Very often a small artificial concrete tank, filled by a hose, will answer every purpose.

We find that ducks as well as geese are now coming into more general use on every well regulated farm. There is a reason. It is not because they have become a fad, but because they have become more profitable. Of course, there is some lack of knowledge in regard to ducks, but this can be easily overcome as they are possibly the easiest fowl to raise.

For these reasons, the duck industry is certain to increase in popularity. Several large duck plants in the East are paying handsome dividends and the same is becoming true with a number in the Central West. The wholesale dealers and packers of market poultry are calling for ducks as the demand from the better class of hotels, restaurants, cafes, dining cars and wealthy families is rapidly on the increase.

The fact that but little fencing and not a great deal of experience, housing or equipment is required, and the fact that ducks are not so subject to lice and disease as some other kinds of poultry, makes it an attractive business to some. Ducks require more feed than chickens and do not lay as many eggs as a rule. For these reasons it is best to sell market ducks when they are about three months old, except those intended for breeding purposes. Ducks should not be allowed to run with turkeys or chickens, or eat from the same hoppers or drink from the same pans.

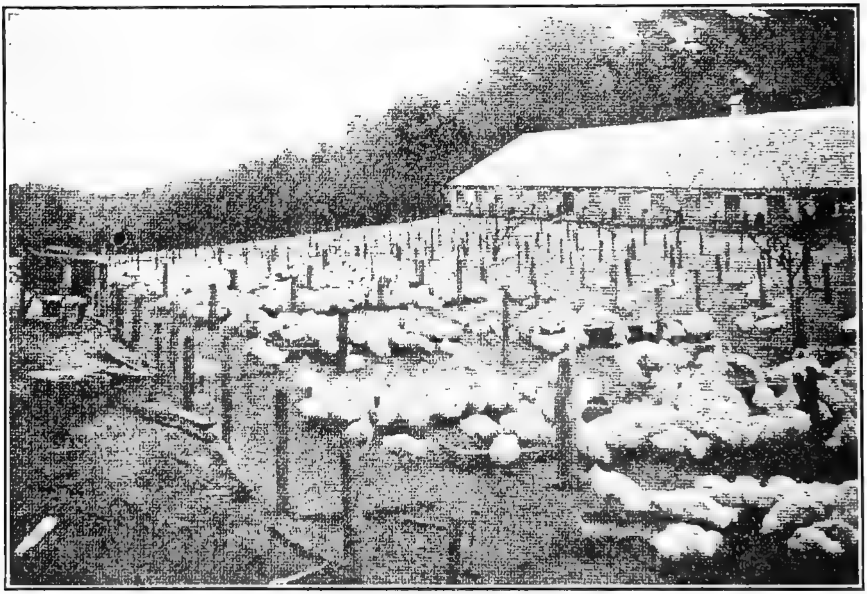
THE ADVANTAGES OF THE DUCK BUSINESS.

The bright side in duck raising is that a low fence will confine them. A shed with dry straw is as good a house as they want. Lice, mites and roup do not bother them. Their feathers are worth 50 cents to 65 cents per pound. Their eggs are better to cook for some purposes than hen eggs, All the white egg strain that lay pure white eggs are worth five cents a dozen more on some markets than hen eggs.

Duck feathers may be made a source of profit. They command a high price and are almost as good, if not equal, to goose feathers.

LOCATION FOR DUCKS.

The most important thing is to locate near a good market and use proper methods. Any farmer that has a plot of ground which is unfit for anything else, often has just the place for ducks. A swampy piece of land which is unfit for farming makes a great place for ducks after they are grown, but not a good place for ducklings. We have seen a side hill, full of cliffs and rocks, devoted to ducks. To our surprise, several hundred head were raised there each year. It seemed to be just the place for them, as it was dry and a most desirable location on the upland for the brood coops and roosting rooms, while the low swampy bottom land that was fenced off in connection with this plot, was an ideal place for the ducks to range through the day. The ducks on this place never had rheumatism and little or no sickness.

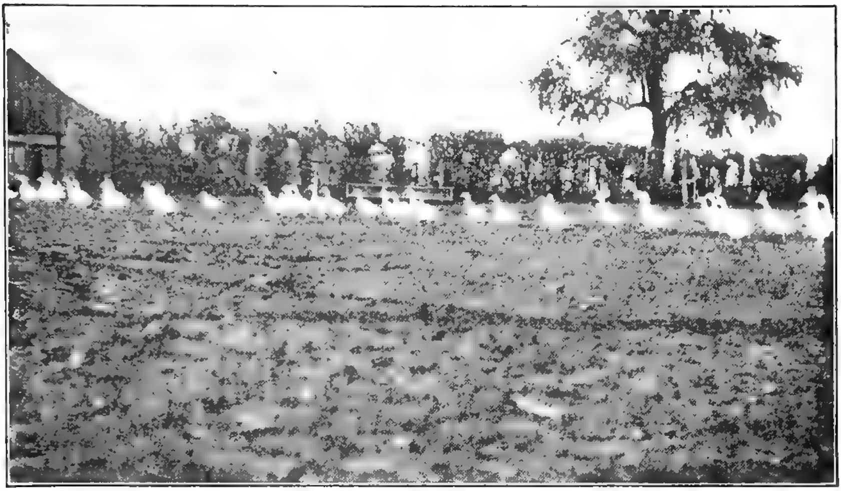


A brooder house on a large duck farm showing the small runs built out from the house. The ducklings are kept here until they are large enough to be transferred to the growing and fattening pens or sheds.

There is any amount of waste land that could be devoted to duck culture with profit. Some put up the excuse that ducks consume too great a quantity of food, but that is imaginary for ducks on range will not consume any more food than chickens, but in growing or maturing ducks, they make so much more rapid growth than any other fowl that they naturally consume more food. It will seldom pay to keep or feed market ducks longer than three months. Ducks thrive under circumstances which chickens could not stand. While this is true, ducks cannot endure unnecessary exposure, but will live and do well where chickens will not. The development and improvement of the methods of marketing during the past few years forms a most interesting chapter in the history of poultry keeping. Many duck plants that have a yearly output of 5,000 head or more cannot fill their orders.

DEMAND FOR DUCK EGGS.

There is an increasing demand for duck eggs. Duck eggs are valuable for baking. Some cafes use more duck eggs than hen eggs because they are larger. than hen eggs. The demand for duck eggs is sure to develop more rapidly than one would naturally suppose, who has never given the subject any thought. The world is demanding more and better things, and just as soon as the average person finds out that duck eggs are really better for some purposes, they will demand them above all others.



Homeward bound after spending the day picking up most of their living from the range and along some stream.

PROPER AGE FOR BREEDING STOCK.

We prefer the use of yearling or two-year-old ducks as breeders. Ducks less than one year old lay eggs which hatch weak ducklings as a rule. We use drakes which are nine months to two years old. We prefer large ducks for the variety they prepresent, but the males should not be too large and clumsy for best results.

FEEDING THE BREEDERS FOR FERTILE EGGS.

In the first place, we must have first class breeding stock. It appears that inbreeding in ducks is tolerated more generally than with almost any other fowl, consequently, we find more inferior breeding stock from this cause than all others. Make your start with good sound breeding stock if possible, or if it is eggs, see that they come from non-related stock and the eggs will be more fertile. Eggs from inbred ducks are seldom ever fertile, and show signs of low vitality from the first.

BAD RESULTS IN OVER FEEDING.

You should keep in mind one thing, and that is that the breeding stock can be over fed just the same as any other fowl but not quite so easily as chickens or turkeys, but they can be and are over-fed in many instances. We have carelessly or rather unintentionally over fed our breeding ducks, until they were almost a total loss to us. It will be well for you to take warning and escape this evil of over-feeding. It is true, ducks have a reputation of being great eaters; in fact many thoughless duck breeders will tell you that you cannot over-feed growing ducks, but such is not the case. Such ducks can be over-fed. Of course, the growing duck is harder to over-feed than the breeders, but it is useless to over-feed any of them as careful feeding will pay in every instance. Over-feeding will give you eggs from which a few weakly ducklings may be hatched, but such usually die before they are a week old. Ducks are as free from disease as any fowl but by over-feeding the breeding stock, they will appear out of condition, have dead, rough plumage, languid movements, and be more subject to sluggish livers, genuine roup and even cholera. Yes, all this and more, if you continue to over-feed them. It is against all this that we are to fight,. if we get strong healthy ducklings from our breeders.

WATER BENEFICIAL TO BREEDERS.

We like our breeders to have access to a body of water during mating time. Ducks are a natural water fowl and when the breeding season opens, they will do much better if tendered these natural requirements. Do not misunderstand, we do not want much water for the ducklings, but for the breeders only. They appear to do better, eggs are more fertile and they produce much better when they have access to water. It is true, hundreds of breeders are mated each season with reasonably good success that never see water except to drink, but from years of experience, we find the ducks mate much better when they have water and the eggs are more fertile. In addition to water, we want green rye, clover or some similar green food for the ducks to feed on. Ducks that have never been inbred and have "living water" to run to, with a strong rye patch to run over for green food, and fed a balance mash ration, will give you the best service possible. Eggs from ducks that are handled in this manner will hatch strong lively ducklings under any favorable circumstances.

DUCKS REQUIRE GREEN FOOD.

Ducks in early spring must have green food. If you cannot have green food such as green growing rye, then prepare refuse cabbage or turnips. Turnips ground into a fine pulp, make a fine food for ducks. We like to feed it if available, no matter how much green rye our ducks have, for it seems to be a great egg producer. It is a hard matter to prepare a fine lot of turnips for the ducks in the fall, and a machine to grind them is easily obtained in the supply houses. The remuneration is great, especially if we have a large number to be fed.

COMFORTABLE QUARTERS FOR STORMY WEATHER.

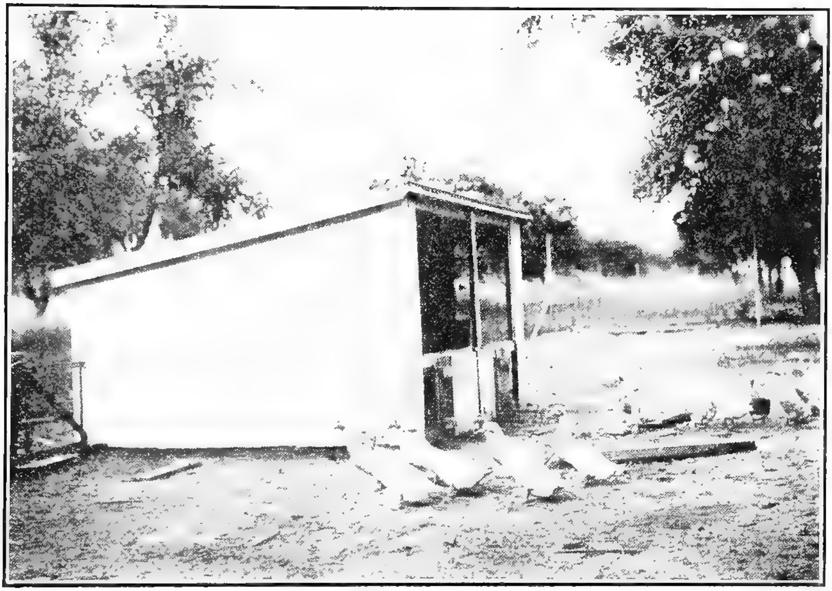
We mate from five to seven females to one male. This gives us the best results possible. Some of the large breeders mate eight or ten drakes to forty or fifty ducks in one breeding pen. We house our breeders at night and provide good comfortable bedding for them. Remember that ducks never go up on roosts, except the Muscovey, but sit down on the ground. For this reason, they should have good comfortable roosting quarters. We bed our duck quarters much the same as the swine-man beds his swine pens. At any and all events, we see that they have good comfortable quarters at night, or they will soon contract rheumatism and die. Wheat straw is the best for the ducks. Put a deep litter of straw in the duck house. No matter how cold it gets, the ducks will be warm. In severe cold weather many people lose their ducks. If you arrange for the ducks to get a square meal at night and have a dry, warm straw bedding so that they can keep their feet warm, they will stand as much cold as you will and more, but if the ducks suffer from cold feet, it soon injures them. A duck's "tender spot" is its feet and legs. If you can keep their feet warm, you will have but little trouble with ducks, but when they become chilled and exposed to the cold damp ground, night after night, they soon show signs of trouble. Where the climate is reasonably mild or uniform, but little housing is required.

HOUSES AND HOUSING.

We have perfected some houses and coops which make the work easier. They help but are not a necessity. The houses for ducklings should be comfortable. We like to cover the floor with prepared roofing, also the roof, and board up three sides. Notice we mention floor first. Do not use a coop or house that will let air come up through the floor from underneath. Keep dry litter in coop; change often enough to keep it dry. A small yard should be attached or connected with each coop unless the whole range given is small. Young ducklings will run too much if range is not restricted somewhat. A bluegrass lot is ideal. Do not leave the ducklings out in the rain if not full featherd just because they are ducks, for they get cramps and usually die as a result.

Old ducks need about the same conditions. The houses need not be expensive or so very warm. They must be dry with no draughts from underneath. A dirt floor is good. If you use a dirt floor it should be raised or filled in several inches higher than the ground on the outside. Straw makes good bedding. Litter in the laying house is essential. The ducks must be kept cooped up until about 9 A. M. when most all the eggs will be laid for that day. We have shallow nests but half the eggs are laid in the straw.

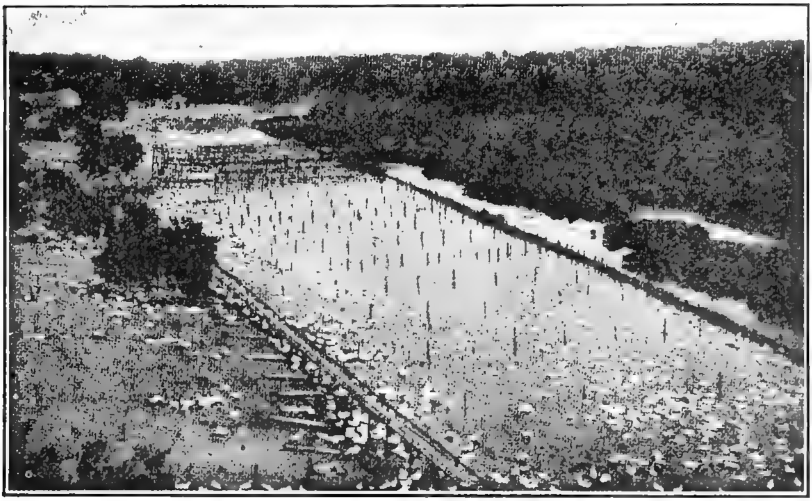
Ducks, both old and young, will let you know if you forget to feed them on time, or crowd or otherwise make them uncomfortable at night. A bunch of growing ducklings will soon fill a coop so full they can not lie down. Keep the house large enough and as the youngsters grow, separate them into smaller flocks. When they are noisy at night, usually something is wrong.



Ducks do not require much housing. They need a shelter on high, dry ground. A cheap shed roof house like the above is splendid for young ducks or for the breeding stock.

BODY OF WATER NOT DETRIMENTAL, NEITHER IS IT A NECESSITY.

By all means, ducks kept for breeding purposes should have a swimming pool, a pond, a brook or plenty of water on which to mate. You will have much better fertility and better hatches. You can raise ducks without a running stream of water, a pond, or a lake, but the vessels from which they drink should be deep enough for them to bury their beaks. We think it a mistaken idea that a stream of water, a pond or lake are detrimental to growing water fowl, and that they should not be allowed to have access to that much water. In the wild state where the ducks nest on the Northern lakes, the young spend much time on the water. We know of a duck raiser who had some Pekin ducks which hid their nests some distance from the farm and the owner supposed they had been lost for good or something had killed them. He had occasion to be passing that way several weeks later and to his surprise found the ducks with their young swimming out on the lake. The ducklings appeared to be about two days old. He decided not to disturb them and found when they had returned that they had outgrown his own ducks of the same age which he had raised and kept from the water. We allow all our water fowls to have access to water at any time. We have had no bad results thus far. They can be easily and very successfully raised without water, but if you have a stream or lake on your farm it is not objectionable for water fowl. In fact, it is beneficial to old ducks and reduces the feed bill with the younger ones, so do not get the idea that you must live on a river or some other place that affords a large body of water. Just such ideas as those hinder the business. Many people are afraid to venture into the duck business for fear they do not possess the natural facilities. Range and feed, with good drinking water, and plenty of sharp sand and grit are all you will require until you get the ducks well feathered. Thousands and thousands of ducks are raised each year that never saw a swimming hole. You can raise ducks to maturity and keep them until they have laid several eggs before you ever let them see a running stream.



One of the large duck farms on Long Island. Water to swim in is not necessary for the growing and fattening ducks, but the fertility of the eggs from breeding stock will be greatly increased if the breeders can get into a small body of water for even a short time each day. Notice the fences across the water, separating the different pens.

DUCK RATIONS.

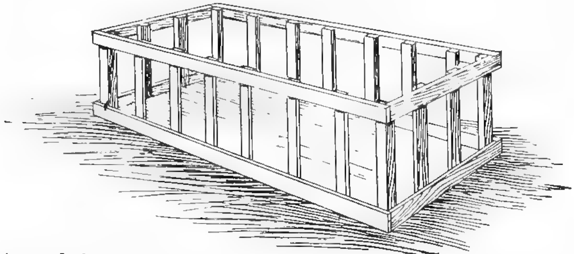
Dr. Prince T. Woods, in his Poultryman's Formulary, recommends the following duck rations, all of which we have found to be good:

On many duck ranches the ducks are fed exclusively on moist mash food, on others on a combination of moist mash and dry grains. In this chapter are given the most satisfactory rations for young and old ducks.

New Jersey Duck Mash.

Wheat Bran	200 lbs. av.
Corn Meal	100 lbs. av.
Ground Oats	100 lbs. av.
Low Grade Flour	75 lbs. av.
Beef Scrap	75 lbs. av.

With every five pails of this mixture are used two pails of dry cut clover (loosely packed in pail). The clover is scalded and lightly salted before mixing with the grain. The grain mixture is added to the wet clover and mixed into a stiff, crumbly mash. Mash is fed when cool, twice daily, supplying a bucket of fresh water at either end of the food trough. Fine grit and fine crushed oyster shell are kept before the ducks all the time.



A good trough in which to feed ducks or young ducklings. Make the sides just high enough to keep them out of the feed, and slats just wide enough so they can eat conveniently.

Ration for Breeding Ducks.

Heavy Wheat Bran	3 pecks.
Low Grade Flour	1 peck.
Corn Meal	1 peck.
Best Beef Scrap	3 lbs. av.
Fine Grit or Sand	1 lb. av.

Mix with cold water. Feed twice daily. This ration is for ducks kept on wide green range or pasture in summer season and intended for breeding stock.

Ducklings Under Four Days Old.

Wheat Bran	1 bushel.
Corn Meal	1 peck.
Low Grade Flour	1 peck.
Fine Grit	2 lbs. av.

Mix into crumbly mash with cold water and feed four times a day all they will clean up in twenty minutes.

Ducklings Four Days to Four Weeks Old.

Wheat Bran	1 bushel.
Corn Meal	1 peck.
Low Grade Flour	1 peck.
Fine Ground Beef Scrap	3 lbs. av.
Fine Grit	1½ lbs. av.

Beef scrap should be scalded before mixing with grain. Mix mash with cold water. Feed four times a day all they will clean up. Give green cut clover, fresh cut rye, or cabbage freely.

Ducklings Four to Six Weeks Old.

Corn Meal	3 pecks.
Wheat Bran	1 peck.
Low Grade Flour	1 peck.
Fine Grit	1 lb. av.
Fine Ground Oyster Shells	½ lb. av.
Scalded Beef Scrap	3 lbs. av.

Mix in 10 per cent fine cut, fresh green food. Mix mash with cold water; feed four times a day all they will clean up.

Finishing-Off Mash for Market Ducklings.

Two weeks before the birds are killed feed the following ration, omitting all green food:

Corn Meal	2 bushels.
Ground Oats	1 bushel.
Beef Scraps	15 lbs. av.
Low Grade Flour	2 pecks

Mix with cold water. Feed three times daily.

FEEDING DUCKLINGS AT VARIOUS AGES OR STAGES OF GROWTH.

The feeding of ducklings is a very important part of duck culture. Here is a good method of feeding ducklings, a formula used by one of the Duck Kings, James Rankin, and it is one of the best: "The first four days, feed equal parts of rolled oats and cracker or bread crumbs, ten per cent of hard boiled eggs, chopped fine, five per cent coarse sand. Feed four times a day, just what they will clean up and no more."

"The formula for ducks from four days to three weeks old is as follows: Feed equal parts of oat meal and wheat bran, ten per cent corn meal, five per cent coarse sand, five per cent fine ground meat scraps with finely cut green rye or cabbage. Feed four times a day."

"When ducks are from three to six weeks old, feed equal parts of corn meal, wheat bran and oat meal, five per cent fine grit, five per cent of beef scraps. Mix in green food and feed four times a day."

"When from six to eight weeks old, feed two-thirds corn meal, one-third equal parts wheat bran and shorts, ten per cent of beef scraps, five per cent of grit. Give access to green rye or other green food equally as good. Feed three times a day. When from eight to ten weeks old, feed two-thirds corn meal, one-third equal parts of wheat bran and rye middlings, ten per cent beef scraps, five per cent grit and oyster shells. If intended for market. feed less green foods, but for breeders provide all the green food they will consume. Feed three times a day."

The foregoing is used by Mr. Rankin constantly and since we have been following the formula, we find we get good results. The food is never cooked, but mixed with cold water and always fed close to their drinking fountains which have been previously filled with fresh water, preparatory to the feeding. Never, under any circumstances, do we feed our ducks until plenty of drinking water has been provided. Let me go over some of this ground again briefly. Do not forget to provide the sharp grit. Duck raisers should never forget to supply their young ducklings with plenty of sand and grit in the first food and see that they have the same ever afterwards. Never over feed, but feed just the amount the birds at various ages will clean up quickly. Keep the ducklings a little hungry. Keep the quarters dry and clean. Remember that ducks will thrive in more filth than any other living fowl, but because of this hardiness do not abuse it. Remember that no fowl can thrive as well in filth as in clean quarters. We have arrived at the conclusion, that if anyone cannot meet with success in raising ducks, he is a careless breeder and will not make a success in any branch of poultry culture.

A flock of young growing ducklings. It is beneficial if each age is kept separate until the smaller ones are large enough to protect themselves. Otherwise the larger ones will trample on the smaller ones and they will also get most of the food. When young ducks are fed, it is a good idea to have plenty of drinking water near by, for the ducks will eat a little and then run to the drinking pan to wash it down.

As previously stated, ducks are in a measure immune from disease, but if you transgress the rules of feeding water fowls, you will produce troubles that will kill them. Use good common sense and feed intelligently and your ducks will seldom get sick but will be a profit and a pleasure to grow.

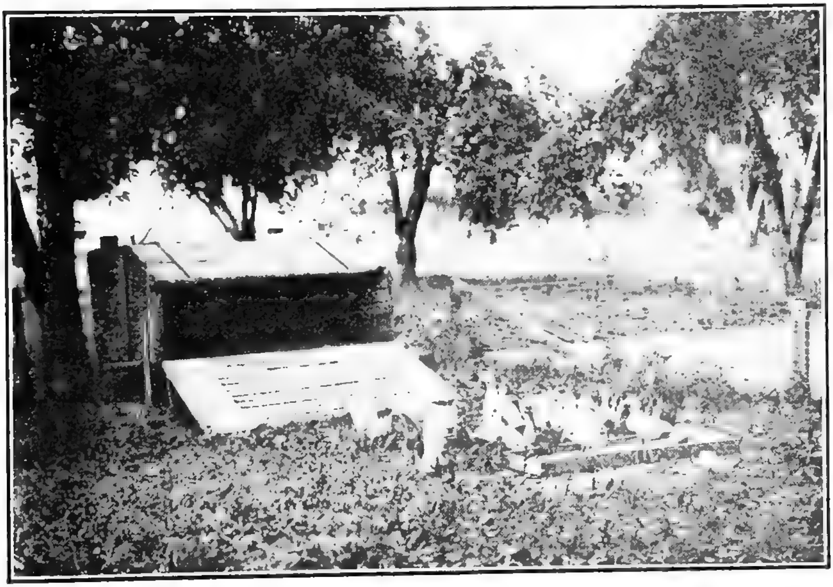
THE INCUBATION OF DUCK EGGS.

The best way for a beginner to start in the business is by procuring eggs from a reliable breeder. Hens hatch a larger per cent, but this method is impracticable for broilers as they do not set early enough and eggs cannot be set in large quantities.

We use the hot air machines, giving very little ventilation until the hatch is well over, then opening the ventilators. The large duck farms use the mammoth incubators and brooders.

After the second day turn the eggs twice daily, and after the seventh day, spray at one turning while out of the machine, using a whisk broom and brushing lightly with warm water. Eggs do not need airing other than what they have while turning. Duck eggs pip about two days before hatching. Stop turning as soon as they begin pipping. Keep machine closed while you have eggs out to turn. Run them at 103 from start to finish, 104 while hatching will do no harm. Do not remove ducks under 24 hours from time of hatching.

The above has been our experience, but if you use an incubator, it is best to follow the instructions of the man who makes it. He should know his machine best. If you use hens, set them as you would with hen eggs. It is desirable that air does not come up through the bottom of nest box and dry out eggs. Do not put over 11 eggs under one hen. Sprinkle the eggs in the nest once a week for the first two weeks, and twice the third week, and every other day until they pip the fourth week. Use lukewarm water. Do not get in a hurry to see the ducklings break out. It sometimes takes two days after they pip. Do not throw the eggs away too soon; put those not pipped, except rots, under another sitter for a couple of days after the hen and ducklings are taken off. You may gain a duckling or two by this. We remove the ducklings when they are thoroughly dried, which is several hours after they come from the shell. These are placed in a warm, well littered box in a comfortable place. When the hatch is over



A cheap but satisfactory duck house built from a piano box.

the hen is placed in her coop with ten to fifteen ducklings,—not too many at first. The flock can be added to until you have all of a size running together. Water is now given them to drink. See that they do not get wet or drabbled.

A TEST IN THE INCUBATING OF DUCK EGGS.

In setting a lot of duck eggs for incubation, some were placed in a hot air incubator, some in a hot water incubator, some under hens in an ordinary nest just off the ground, some under hens on the ground, and some under hens on a board floor in the hen house. In 28 days, the results were that each incubator hatched about the same amount, a little over half. Those in the nests, half. Those on the ground, every egg hatched, and those on the board floor did not hatch a duck. The moisture from the ground is what helped bring about a good hatch where the eggs were set on the ground.

It requires more moisture for duck eggs than other eggs and duck eggs in an incubator should be sprinkled often. After the ducklings pip the shell, they will lay about 24 hours before making their exit from the shell, so do not be in a hurry to release them from the shell.

DUCKS DO NOT REQUIRE MUCH BROODING.

In brooding ducks and chickens there is very little difference, except that ducks take much lower temperature than chickens and for a shorter time. Do not forget shade even in February and March. When they become crowded move to a small building and give deep bedding. Keep dry and quiet, housing them at night as they are very nervous at all ages. The large commercial duck plants use the larger brooder houses in which to start the young.

PROVIDE A DEEP DRINKING VESSEL

Put the ducks in a run with plenty of shade so they cannot run very much. Ducks need plenty of clean water to drink. The water should be in vessels deep enough so they can get their whole bill under and rinse their nostrils. (A gallon crock with a brick in it is all right for it is easily cleaned.) If this is not done, the nostrils become clogged, the eggs affected and the ducks will get sick.

We use pie pans, milk pans, and finally crocks for feed and watering troughs as the duckling grow to use the various heights. Galvanized 10 or 12-quart buckets are handy for adult ducks to drink from. We rinse and fill these three times a day with fresh water. Always give fresh clean water when feeding.

DUCKS BENEFICIAL TO POTATO PATCH.

If the farmers throughout the United States and Canada would build portable duck houses and keep a flock of pure bred ducks near their potato fields, we would soon be rid of the potato bug curse, for if ducks are properly handled, they will keep the potato patch perfectly free from insects and not injure the growing crop

KEEP STRANGERS FROM BREEDING PENS.

In housing the breeding ducks in October, I use plenty of straw or litter in the house and always keep it dry by putting new straw in as soon as it gets wet. I do not remove the old as ducks get timid and easily frightened and it might stop them from laying. It is well to go about them gently and allow no strangers to get near them. The best results may be obtained both in regard to egg yield and fertility by keeping all people away from them except the one who feeds and cares for them.

PROPER AGE TO MARKET.

Of all fowls, the duck is the quickest to mature. Duck raisers in the Eastern States who make duck raising a business never keep their ducks longer than twelve weeks. Then they are dressed and sold in the large cities as Green Ducks or ducklings. If you never ate a young duck, properly cooked, you have missed much of the pleasure of this life.

POINTERS.

1. To make Big Show birds use the laying feed and always give all they will eat.
2. Eggs will be laid by nine o'clock in the morning—keep the ducks shut up until then.
3. Ducks lay from 25 to 100 eggs each from January to July, as a rule.
4. Size is the first requirement by patrons.

5. Mature young ducks and laying stock out of season need but little feed from July 1st to December 1st, when on range.

6. Overfat stock are not as good for breeders.

7. In small flocks, mate one male to five females; in large flocks, one to seven. Some of the large commercial farmers mate 40 or 50 ducks to 8 or 10 drakes in one breeding pen.

8. Ducks do not need expensive houses.

9. Nests for laying ducks are made by placing a board upright about one foot from the wall and leaving an open space at each end, filling in back of board with straw.

10. Green stuff must be supplied. Lettuce, rape or tender leaves are all good.

11. One thing should be remembered, keep the little ducklings out of the sun. After they are four or five weeks old, we turn them in a yard of rape which we have ready for them. This affords green stuff and shade.

12. Keep oyster shell and chick-size grit always before them. Keep good clean water to drink and plenty of it.

RESULTS OF CARELESS METHODS.

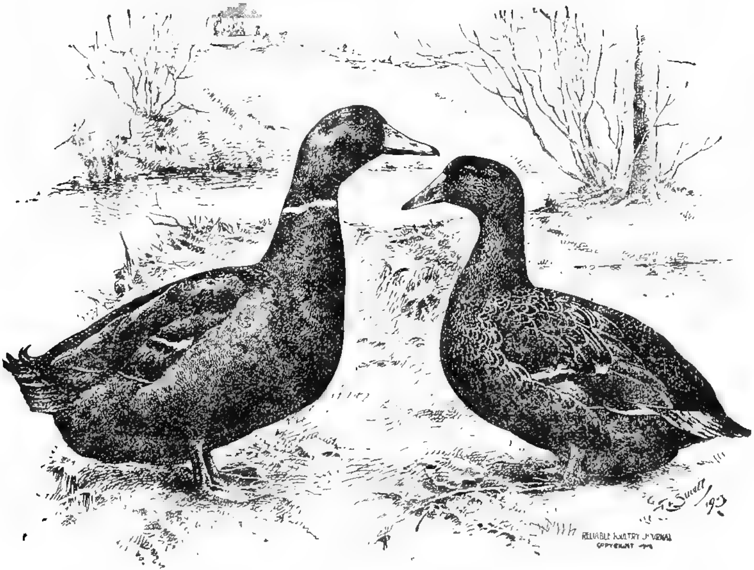
With careful feeding and dry roosting coops, you will marvel how they grow. Be careless, let soured food accumulate, wet coops, drabbled ducklings, etc., and failure is the result. A sick duck in most cases is a dead duck.

POPULAR VARIETIES OF DUCKS.

There are several varieties of Standard-bred ducks that have become very popular. While the American people's attention has been directed for the past few years to the Indian Runner ducks, due largely to their enthusiastic advocates, yet, the many old-time varieties are still holding their place with the fashions of the world. There is no duck grown that is more popular than the Pekin. There is no duck grown that is superior to this variety, all things considered. While the Pekin and the Indian Runner are very profitable, the Rouen, the Muscovy, the Aylesbury and the Cayugas are likewise profitable and popular. The Pekin and Indian Runner, of course, are the two leaders.

ROUEN DUCKS.

We might say that the Rouen is a very close rival of the Pekin. This variety can be grown to an enormous size. The Standard weights of the Pekin and the Rouen are the same.

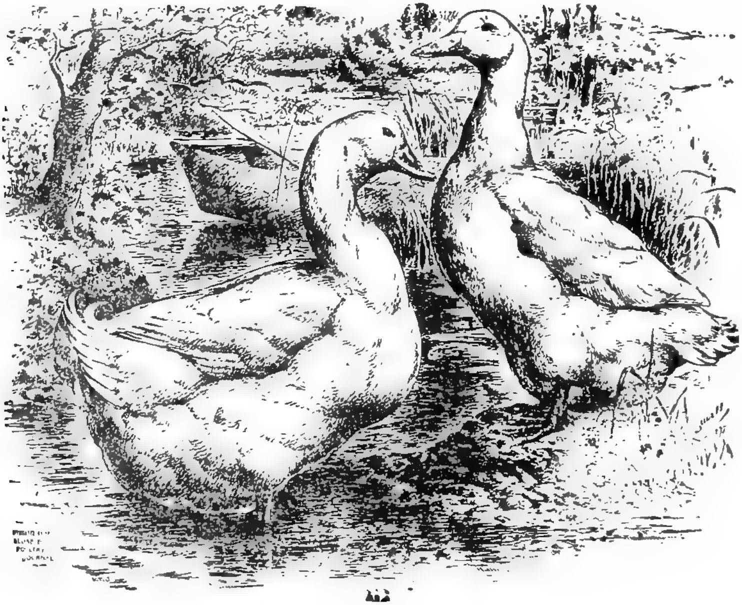


Rouen Ducks.

To our mind, the Rouen is the most beautiful duck grown today. The drake has a very lustrous green head, with an ash grey body. They have a most beautiful wing, which adds splendor to the appearance of the variety. The slaty black bars, edged with a line of white in center, make them attractive. The females are a bright brown, richly marked with a wide penciling of greenish black. Wings appear much the same in color and markings, except the wing bows are distinctly penciled with a light brown that conforms to the shape of feathers. They were first discovered on the banks of the Rouen River in France many years ago. They are, without doubt, the wild ducks of Rouen, France, greatly enlarged by careful breeding and domestication. No duck to our mind could appeal more to the lover of fine arts than the Rouen.

THE PEKIN.

We cannot add much to the magnitude of the well-known Pekin. They are very beautiful in color as well as station. The duck is shaped like the drake, except much deeper in stern, a little more full and square. Having beautiful colored plumage and rich orange red shanks and feet they make a very striking combination, especially to every one that admires clean appearances. There is one peculiar feature about the Pekins, and that is this: Black in the beak is a very serious defect; the drake is disqualified for this defect, while the ducks must suffer a severe cut. Now the strange thing is, the larger you breed them the more this defect appears. Some breeders claim that at least 95 per cent of the ducks when bred beyond Standard weight show this defect, the smaller specimens escaping this defect to a less degree. It appears that this variety will take on an enormous amount of flesh, and retain it until laying time, when it all goes to eggs. As soon as the fat is consumed by eggs, they cease to lay. This is the variety which is used chiefly on large market or commercial duck farms, and is the variety we recommend for that purpose.



Pekin Ducks

THE MUSCOVY DUCK.

Now comes that freak of the duck family, the Muscovy. While they are queer to the average man and woman, they are very popular. Truly, they are an oddity and many lovers of "freak" birds have them in their collections of queer specimens. In habits, they are entirely different from any other Standard variety of ducks. The Standard calls for them to be black and white in color. The dark should show a lustrous green sheen in the sun and greatly predominate. They have a most peculiar head, being very red on sides of face and with a crest on top, which is raised and lowered as desired. The male birds grow to enormous size. The females are medium in weight but large compared to other varieties of ducks. These ducks are not so valuable for the feathers they produce, but are considered by some as the best table variety of all ducks. Strange as it may appear, yet it is a fact, they make their nest in the most peculiar places, where no one would ever suspect. For instance, up in the hollow tree, or in the hay loft, or in other such places. They always make their nest, if possible, where the elements can have no effect on it and carefully line the nest from the down of their body. The nest is built to stand for years, it seems. They are good layers and eggs very fertile as a rule. We have known them to begin laying early in the spring and lay until late in October. There is no variety that will lay more eggs than the Muscovy, except the Indian Runner.

There are two Standard varieties, however—the colored and the white. The colored are the most extensively bred. They are identical, except in color.

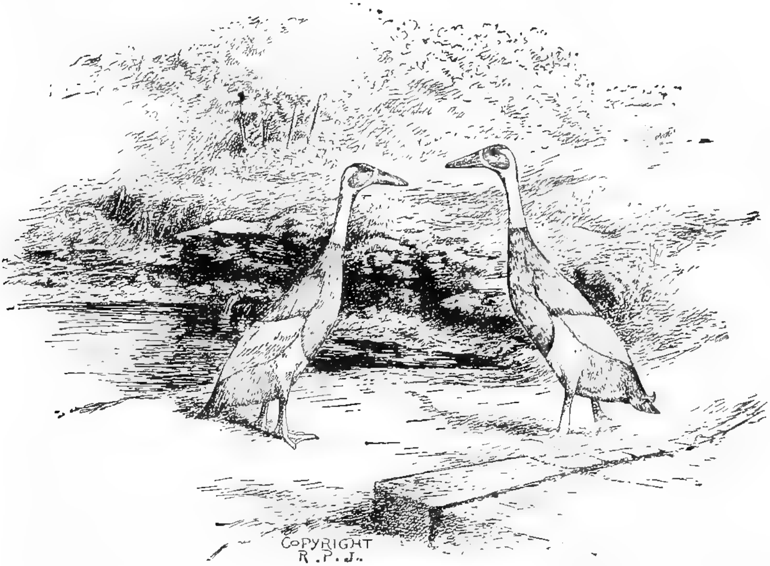
As previously mentioned, they are the most peculiar bird known Among the many peculiarities of this variety, is the fact that it takes just five weeks to incubate their eggs. While this is a long time, it seems, when the ducklings do appear, they are full of life and vigor. There is no fowl as easily raised as the Muscovy. If a mother duck hatches off 20 ducklings, she usually matures 20. This is just about as good a record as any duck can show. Another thing about them which is very queer, is the fact that you may raise every known variety on your place and let them run with the Muscovy, and they will never mix with them. In fact, they are very aristocratic in all their ways. They practically raise themselves, and do not need much attention. They can whip any bird that lives unless it is an eagle. They will not eat as great an amount as other ducks. They are long-lived, much more so than others.

THE AYLESBURY AND CAYUGA DUCKS.

The Aylesbury duck is in the same class with the Pekin except being pure white in plumage, with flesh-colored beak and shanks. They are their equal in quality and are very extensively bred in some sections. The Cayuga duck is quite an old variety. No so extensively bred of late years as formerly, nevertheless they are a strong variety when it comes to quality. Possibly the reason for their unpopularity at the present time is due to their black plumage. Black at one time was all the rage, while now it is white or red and buff. They are, of course, purely wild birds domesticated. They are very hardy; being a wild bird naturally tends to make them very vigorous and full of life. They are good layers and fine table fowl. Any one admiring a black fowl cannot help but admire the black Cayuga duck, which has plumage of the blackest black.

INDIAN RUNNER DUCKS.

There has been so much written about the Indian Runner duck that almost every one knows the popularity of them. There are three distinct strains, the Fawn and White, the Penciled and White, and the pure White, all supposed to be identical except in color. While some writers claim the superiority of one over the other, yet in a degree they are all the same. They are said to be the Leghorn of the duck family. They are not so large as some of the other breeds mentioned. They lay a beautiful white egg. They are extensively bred. They are in great demand, being hardy, easily raised and managed. They never range far from home, and usually lay their eggs before 9 A. M. every morning. Some breeders claim that some individuals among a flock of these ducks will lay 225 eggs or more per year. They will not all do this by any means. There are good and bad, but where they have been carefully bred, quite a number in the flock will make good records ordinarily. There are many Indian Runners that have been crossed with other varieties, which goes against them to a large degree, but where they have been bred in all their purity, they are very attractive and profitable.



Fawn and White Indian Runner Ducks. There is also the pure White Runner and the Penciled Runner Ducks.

INTRODUCING NEW BLOOD IN THE FALL.

There is one thing breeders should learn to do in buying new blood, and that is to buy in the fall, for several reasons. First, because it takes about three months for ducks to become accustomed to a new location, to become contented; second, when you buy early, you have a better chance to get the best that grows. When moving them from one place to another, sometimes it retards them from laying, and, in many instances, prevents laying entirely for that season.

DUCK DISEASES.

Ducks are not subject to disease like chickens, and by following a few simple rules, a person can make a success of raising ducks, when with chickens, it takes years of experience to be proficient. Ducks do not have cholera, lice, roup, etc. About the only troubles they are subject to are these: Leg weakness, caused by sleeping in damp places; bowel trouble, caused by lack of commercial meat in food; cramps from being allowed in rain or very cold water when young, and sunstroke from lack of shade at same age. Any of which can easily be prevented.

MOST COMMON DUCK DISEASES.

A number of duck breeders were asked this question and you will note their testimony:

Describe most troublesome diseases of ducks and give your most successful method of treating same.

"Leg weakness. Plenty of fresh air day and night." W. R. Curtiss & Co.

"Rheumatism from keeping them in wet house in cold weather." Byron Patterson.

"This trouble among very young ducks; they stagger and fall on their backs and die in a few days—sometimes immediately. It very seldom shows itself until warm weather, in April or May. I think it is caused by over-feeding and that it can be overcome by feeding lightly and keeping clean water before them." F. S. Keith.

"Leg weakness is the most troublesome disease of ducks. It is caused by too highly concentrated food and tôo much of it. Feed a light food, mostly wheat bran and from 10 per cent. to 15 per cent. beef scraps." W. R. Sprenkle.

"In the past few years we have not lost over one or two per cent of our young stock; this year not that much. With the older birds, occasionally one 'goes light.' There is not much chance of curing it and think it better not to do so." Paul G. Springer.

"I am not troubled with any disease among my ducks worthy of mention. Sometimes have 'scours' a little in ducklings, but have found nothing to prevent it or cure it except to have good, hardy parent stock." H. M. Proud.

"Sunstroke is the only trouble we have had. To remedy this, furnish plenty of shade, reduce heavy feeding in hot weather and keep ducks from swimming ponds. Give dry, clean quarters at night. Ducks affected by sun should be put in a cool shady place as soon as noticed. Give warm food, bathe head with warm water." H. E. Moffat.

"Pneumonia, staggers, diarrhoea, leg weakness, cramps or rheumatism. Pneumonia is caused by damp and filthy quarters or by giving ducks a run in the early spring during slushy weather after they have been confined in the buildings. Leg weakness, cramps and rheumatism are caused by dampness, filth and overcrowding. Prevent the disease by avoiding the cause or removing it." A. B. Coolidge.

AN EASY METHOD OF DRESSING DUCKS.

After the ducks have been killed and well bled, have a large quantity of boiling hot water poured into a tub or vessel large enough to entirely submerge the fowl. Add about a pint of cold water and this will prevent the flesh from cooking on the wings and the tender portions of the bird. Place the ducks in the water and dip them up and down and work them about in the water until they are thoroughly steamed. Then take a cupful of this water and as you pull the feathers back the wrong way pour the water onto the duck and into the feathers. You will find it necessary to scald a duck at least twice as long as you do a chicken, but if this method is used it is not much more trouble to dress a duck than it is a hen. After you remove it from the vessel put the duck on a paper or table and pick the duck with both hands while the feathers are still warm. What little down is left can be removed by singing. This method is recommended where ducks are prepared for home consumption, or for private table.

PROFITABLE GOOSE GROWING.

No other young poultry can so easily look out for themselves as young goslings. After the first few days they require very little care and are raised almost exclusively on grass pasture or other green forage, corn fodder or young green rye making excellent pasture for them. Under such conditions, young goslings go confidently on their way, asking no favors, and picking what to them is first class fare from the grass and bugs to be found about them.

After the first few weeks they may be left to follow their own inclinations as regards roving, but they should not be allowed water for swimming purposes. Plenty of fresh water to drink should be within their reach at all times. They require no fancy foods and can and will thrive on grass alone, but grow more quickly and make a better development if other food is given them. Most goose growers supply the goslings with an abundance of green food for the first seven or eight weeks and they are then allowed three to four weeks fattening to be in good green gosling condition for market. With the ease with which they reach market proportion at twelve weeks, together with the fact that they are remarkably hardy, is it any wonder that the interest in goose growing is increasing?

As a side line for the poultryman or farmer, much can be said in favor of goose growing. With good pasture land, the average farmer can raise marketable goslings with a minimum amount of labor and expense, and in doing so increase in no small degree his yearly profits.

Geese possess remarkable freedom from disease and have an undoubted value as table poultry both on the market and for home consumption. The cost of housing is very small and the fact that the care and feeding of geese is believed to be less than in other varieties of domestic poultry makes the present demand for green goslings worthy of consideration.

In connection with the rearing of geese in small numbers by farmers, so-called fattening establishments are conducted where geese in great numbers are brought from all sections of the country and in flocks of from 100 to 2000 are fattened and prepared for market. The goslings when fully feathered are bought up from the farmer and in about four weeks are killed and marketed. This branch of the goose growing industry has progressed quite rapidly during the last decade, especially in some sections and there is every reason to believe that similar establishments would prove profitable in many sections of the country.

The fact that geese can be turned out to pasture for as much as six months of the year, during which time the cost of keeping them is little more than the value of the grass they consume, together with an increasing market demand for green geese has undoubtedly been the means of again awakening an interest in them, especially on farms where there is waste pasture land. It is also a fact that geese are particularly hardy; sickness being almost unknown among them. Neither are they much troubled with lice or vermin as are other varieties of fowls. Aside from their market value as food, the feathers from greese are always salable at a good figure and are an important item. The demand for "green goslings" in most Eastern markets is good from early in June until the last of February with "top prices" at the beginning of the season. The cost of production is variously estimated but generally agreed to be comparatively low.

We believe that the average poultryman who has a strip of pasture land, as well as a love for the beautiful in fowls, would increase both his pleasure and profit by the intelligent breeding of geese.

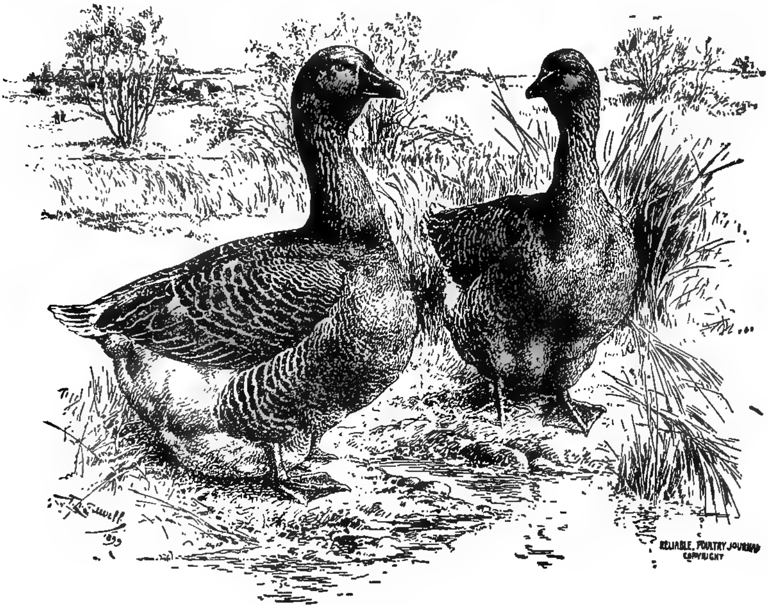
The first known domesticated geese were owned by the ancient Greeks and Romans. The origin of the domesticated goose dates back hundreds of years before the birth of Christ. We have several accounts of ancient geese in old English literature. Evidently geese have been profitable fowls for hundreds of years. There are some expert poultrymen keeping a number of geese for experimental purposes and have given out the most desirable varieties, as follows: Toulouse, Embden, African, Chinese and Canadian. The Standard gives us a variety known as the Egyptian goose. The Embden and the Toulouse are bred extensively. There are two varieties of the Chinese, brown and white. We might add that the African is a distinct variety. Same is true of the Canadian.

There are perhaps more Toulouse geese raised than any other, due to market demands for them. There are possibly as many other varieties raised among fanciers as the Toulouse, but such is not the case with farmers and the large market breeders. In breeding geese, the fanciers consider the same disqualifications for the geese as they do for the ducks, that is, twisted wings, crooked back and wry tail. The Toulouse gander and goose resemble each other so closely, it is very hard for the amateur to determine the sex. Our method of distinguishing the sex, is to learn the voices. The voice of the female is coarse, while that of the male is fine. The male has a thicker neck and is more masculine in appearance.

TOULOUSE GEESE.

The Toulouse geese are a variety that commands enormous size. Both sexes possess large, broad, deep breast, broad back, with slight concave from neck to base of tail. In this variety we want a head very large, with beak short, but stout. With fanciers, the dewlap is regarded as very valuable in old fowls. Young birds do not possess a dewlap. They attain a great weight of 30 pounds quite often. The Standard requires adult ganders to weigh in ordinary flesh 25 pounds, the adult goose 20 pounds, young ganders

20 pounds, young goose 16 pounds. Geese bred to this size are very valuable, but when they reach the size of 30 pounds, they are regarded as high-class exhibition specimens. The great size of this variety makes them very valuable as market geese. This gives us a water fowl as large as the Bronze turkey, and many farmers that are not located so as to raise turkeys, grow geese, as they do not require a large farm to range over, only a good pasture field and water. It is said that the Toulouse is one of the best laying geese of any of the goose family. Where they are highly bred, they seldom ever become broody, some specimens laying until well up in summer. As to color they are very desiarble, being a "blue gray," as termed by some fanciers, but the Standard calls for different shades of gray in various sections of the body. The young are very hardy, easily raised and mature very rapidly. The error of feeding too much fattening food to goslings often causes sudden death. Goslings should not be fed heavily on fat-producing foods, where they have plenty of pasture and natural water supply. Goslings are easily fattened and will get too fat, when fed on a ration of corn meal or any other fat-producing food. Where they have plenty of pasture, they will practically make their own living.



Toulouse Geese.

EMBDEN GEESE.

The Embden geese rank well up with the Toulouse in popularity. They resemble the Toulouse in shape more than any other variety of geese we know of. They have a long neck, in fact they are more lengthy in all sections, and pose in a more erect style than the Toulouse. They have a pure white plumage, with a rich orange colored beak, shanks and toes. These desirable features, with their bright blue eyes, make them a most attractive variety. Their feathers are in great demand in all markets. In the show room, they appear to attract more attention than almost any other variety of geese. The Embdens are a very profitable variety to breed on account of their feathers being in such great demand. In some markets, their feathers bring considerably more than other feathers. With proper surroundings for goose farming the Embden can be grown readily with profit. There is one thing about well-bred geese, practically every breeder that has any push about him has not been able to produce enough stock to supply the demand, and especially is this true of the breeders of Embdens.

AFRICAN GEESE.

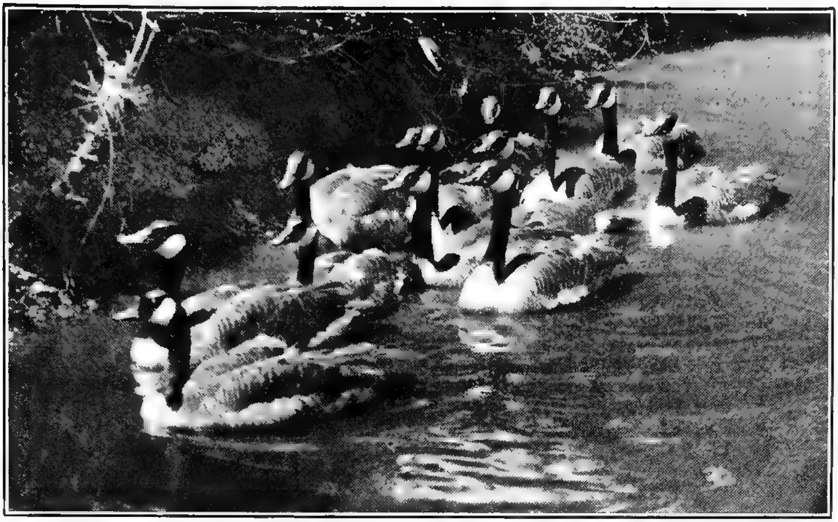
The African geese are a very desirable variety and are bred extensively. They possess a very large neck and head, with heavy, well-developed dewlap in matured geese, while the young geese do not have as well developed dewlap as they do when they reach one year of age or older. Their long curved neck, broad, flat back, breast medium full, and bodv long and large, carried upright, gives them a sprightly appearance, which is very much desired with the better bred varieties. They have a very pleasing color for a water fowl. Head is black, with large black knob and beak. The neck has a dark stripe running down the entire length to back. Aside from these special markings the plumage resembles that of the Toulouse. A flock of African geese, when bred up to a high state of perfection, are very beautiful and sell for long prices to fanciers who wish to exhibit them. The young are very hardy and, like all other geese, live largely on grass, if given range. The absence of knob or dewlap on the African goose is a disqualification and this is regarded a very valuable section by goose fanciers. Should you produce an African goose with a yellow or flesh-colored beak or knob, it would be worthless from a fancier's point of view. These points must be black and very prominent. The larger and more pronounced the better. White primaries like the Embden are a diqualification and great care must be exercised not to permit any foreign color in wings, or elsewhere for that matter.

CHINESE GEESE.

The Brown and White Chinese are identical in shape, but vary in color. The plumage of the white varieties are pure white. The knob, toes and shanks yellow. They are of the same weight, being much smaller than either the Toulouse, Embden or Africa. The Brown Chinese have a dull, yellowish-brown stripe down back of neck from head to body, while the body color is a grayish brown. The knob of the Chinese geese is a very desirable section and must be large, the larger the better. The knob is black and bill is black, while the shanks and toes are of a dusky orange. The same qualifications stand for these as for the African. They are classed as ornamental geese, however, and are not very good layers. Their grace and great beauty attract the attention of the fanciers and soon become very popular with the fancy trade, but not so much with farmers and market men, as the larger varieties answer their requirements much better.

CANADIAN OR WILD GEESE.

The Canadian geese are bred largely for ornamental purposes. Of late years many breeders have crossed them up with some of the larger varieties and today this class of geese are in great demand in the Eastern markets, especially so with the Jews. These people buy those large, well-fatted crossed breed for their fat and for the meat as well, but mainly for the grease. These hybrids, strange to say, cannot be crossed further and the reason is unknown, but breeders that have experienced the mating, state that the eggs are never fertile after you attempt to run the cross further. The first cross between the wild goose and any of our domestic geese proves highly satisfactory and the progeny is very desirable when matured and fattened for the festive markets. The head of the Canadian goose is very small compared to the body. The neck is also very slender, presenting a "snaky" appearance. The body is long and slender, wings very long and powerful, sufficient power in them to carry them hundreds of miles and for days without making a single stop. The Canadian geese are being bred very extensively in America. Many breeders do not breed any other variety, as they claim they are more hardy than any other goose, and very beautiful in color. Head, beak, shanks and toes are black. Plumage, gray and black. Lower posterior parts of the body are white, and tail glossy black.



Canadian or Wild Geese

EGYPTIAN GEESE

The Egyptian geese are altogether an ornamental fowl. They are not considered by market men at all. Since they are of such a ferocious disposition, they are not bred by many fanciers or market men, but by novelty breeders and "zoo gardens."

Since we have increased in foreign population, the demand for geese has become very great as foreigners consume more of this kind of meat than Americans. Many nations do not eat a great deal of any other kind of meat. The feathers are used by our people very extensively. There is a steady demand for feathers and eggs.

NUMBER OF MALES TO MATE WITH FEMALES.

Nature's plan works best in rearing geese. Let them pair off as suits their notion and disturb their nests as little as possible. If they have grass and water in their pasture they will soon repay for all expended on them. There should be just as many geese as ganders and they should have a pond or branch, as their natural mating place is on the water. If this plan is followed you will never have many infertile eggs. Pen three or four geese with one gander and allow just water enough for the tip of their bills to get into and you will not get eggs that will hatch the entire season. Without a swimming pool, the old and young geese soon develop a form of paralysis, caused by black lice at the base of their heads, resulting in speedy death. The baby goslings when shut away from water will sit in the grass and go through the bathing motion, always passing his bill over the back of his neck and at the base of the wing quills. The gander helps raise and protect the little ones.

PROPER AGE FOR BREEDERS.

Eggs should always be used from old geese, not under two years old, as eggs from young geese are never as strong in fertility as old goose eggs. We have heard many breeders claim that eggs from young geese will not hatch at all, but this is a mitsake, though the eggs do not prove as high in fertility as the eggs from the old geese.

DETERMINING SEX OF GEESE

It is quite difficult for an amateur and often an experienced breeder can only tell the sex of his geese by making a physical examination. Some of the best methods are as follows:

"The gander is heavier with longer neck and larger head than the goose. A physical examination of each bird is the only sure method to determine the sex for all varieties at different ages." W. M. Sawyer.

"You can tell the sex of geese by their 'squall' and by the shape. The female's neck is thinner than that of the male." J. H. Worley.

"By physical examination. Some tickle them under the wing when the female will cackle or chuckle while the male remains silent." F. J. Gross

"Catch birds, and by gently pressing around vent, the sexual organ may be easily observed." F. D. Fowler.

"The goose has a low bass voice while the gander's is more sharp like a whistle. The goose has a short neck; the gander has long slim neck and is always in the lead." F. J. Damann.

"Males hold their heads more erect, neck longer and heads a little larger though in well grown goslings, this is difficult to decide." S. A. Little.

"Sex is determined by general appearance and the voice. In male it is shrill, while the female's voice is hoarse." Mrs. B. F. Bishop.

BEST TO START WITH STOCK, NOT EGGS.

It is much better to start your flock with a pair of birds rather than eggs. Geese are peculiar, and their eggs are more so. They stand shaking and shipping so poorly that eggs shipped from a distance for hatching are rarely satisfactory. A pair of big-boned breeders, thin in flesh, will be quicker and surer. The first question from the prospective buyer is: "What does your bird weigh?" This leads the breeder to feed too heavy in order to keep the required weight. So instead of a muscular, active breeder, you often get a small boned, bow-legged, butter-fat goose, absolutely worthless to breed from.

YEARLY COST OF KEEPING A GOOSE.

Growing geese is usaully very profitable, as they consume mostly grass and hay, making food inexpensive. It costs about four cents per pound to push them for market until they weigh ten pounds. We have received as high as twenty cents per pound early in the spring for a gosling and ten cents late in the fall. Culls are all we sell on the market, the rest being sold for breeding purposes. With a clover cutter, clover and alfalfa hay can be cut fine for geese, and they can be kept through the winter on this with a little grain occasionally. Geese should not be fed much corn until you are finishing them for market. They fatten easily with plenty of hay, vegetables and grass in summer. It will cost only about fifty cents a year to keep an adult goose if handled in this way.

RANGE NECESSARY FOR GEESE.

No matter what variety of geese you select, range is the all-important feature in goose farming. The goose that has been fondled and heavily fed and has never had ample range is almost worthless as a breeder. In buying geese, be careful to obtain only those that have been accustomed to foraging for their food. If so, they will be found thrifty and full of vigor. If otherwise, you will find them lazy, stupid, worthless creatures. If you do not give range and attempt to grow geese in confinement, you will find them very expensive to keep. Grain does not agree with geese like grass. We would not attempt to grow geese without pasture for them, as they do much better on grass and, at the same time, it is their natural food. We only feed grain to our geese when we wish to fatten and market, and then our geese are grazed and fed grain at the same time. They will fatten very fast when fed grain and allowed plenty of pasture and water. Breeders, or birds intended for breeders, should be fed but very little grain when they have ample range and grass. The majority of failures with geese is due to over-feeding. It is all right to feed liberally, those that are intended for market, but entirely out of place when intended for breeders. Geese and dairy cattle do fine together, if there is plenty of grass, as the geese will feed on grass and the droppings of the cattle, and by the time cold weather appears they are fat and ready for the market. We do not care to have our geese run with cattle that are fed corn or fat-producing food unless we expect to sell on the market. The breeding geese should never be allowed to range with fattening cattle. Market geese only should be allowed this privilege.

PROVIDE RYE PASTURE.

In winter, we like the geese to have some green food. A rye pasture is fine. Rye for geese for winter green food is superior to anything we have ever used. Geese do well on rye and require but very little feeding, if they have plenty of rye pasture. The only feeding we do is when snow is completely over the rye and frozen so that the geese cannot get it. As long as we grow geese, we will grow rye, as the two go hand in hand. When we have rye pasture through the winter for our geese and can have plenty of moisture through the summer for grass, our geese can be grown at the least expense and at the greatest profit.

GEESE REQUIRE PRINCIPALLY GRASS AND WATER.

In winter we feed lightly of corn; they eat the bloom of clover hay greedily, also bright corn fodder and cow peas.

The idea some have of geese is absurd. Geese are easily raised and very profitable, but you must understand their requirements just the same as with any other fowl. Grass is the natural pasture for geese. It is their natural food, both for young and old geese, and as long as you have plenty of grass, feed but little grain or food of any kind. Geese must have water. That is a fact, but it does not necessarily have to be a large body of water. Good, clean drinking water available for the fowls at all times with plenty of tender grass; will put your geese in the very best condition and mature the goslings in prime condition. We will admit that a large body of water after the geese are grown is very desirable, and the geese enjoy it, but geese can and are grown every year that never see water except for drinking purposes. If you cannot do any better, keep a large washtub full of water where the geese can get in it.

In addition to grass range it is quite often advisable to give breeding geese other rations for best results. Some well known breeders recommend the following:

"Wheat, bran, oats and corn twice a week." J. H. Worley.

"Whole corn with wheat and other small grain." F. D. Fowler.

"I feed mine as I do laying hens; three parts bran, one part wheat middlings, two parts corn and oats mixed. One part of beef scrap to ten of mixture. Mix more moist than for hens." S A. Little.

"In fall and winter feed cut clover or alfalfa, soaked in warm water mixed with a little corn meal and shorts. In the breeding season in addition to grass, feed twice daily, by measure 4 parts bran, 2 parts shorts, 1 part corn meal, 5 per cent beef scraps. Oyster shells before them." W. M. Sawyer.

"Forage with a little oats and corn. Oats are better soaked or scalded and fed in troughs." Mrs. B. F. Hislop.

"Corn meal, bran and scraps mixed together. A little corn, potatoes, turnips, etc." H. L. Sweet.

"Cracked corn, bran middlings, and grass or cut clover." F. J. Gross.

"Oats and barley. Wheat and a little corn twice a week." F. J. Damann.

THE PROPER LOCATION.

While it is a fact that geese are water fowls, and low, wet land unfit for anything else can be used on which to grow geese, but at the same time we want a dry, high location for a roosting place for geese. You give geese access to high quarters as well as low land and you will notice they always go to the highest point every night to roost. This is easily understood. Geese contract rheumatism when compelled to roost on low, wet land. They invariably select a high spot at roosting time. Shade is a necessity for geese in summer. Without shade geese do not appear to do well, if they are forced to remain out in the heat all day long. An orchard is an ideal place for geese in the summer time. We have seen our geese devour a multitude of worms that fall from the apples and limbs. Not only this, but they will skin every piece of rough bark from the trunks and devour many deadly insects that are injurious to fruit trees. We have run our geese in the orchards time after time and know they will help rid an orchard ot deadly insects.

CARE OF GOSLINGS—INCUBATION AND BROODING.

Goslings are cared for much the same as turkeys when first hatched. When goslings begin to hatch, we place them in a basket lined with a good warm woolen cloth, so that when they are placed in the basket we can cover them up snugly and keep them warm until the hatch is entriely over. It is the nature of all fowls when young to want their backs warm. Any and all fowls require back warmers, so we cover the goslings up carefully and place them in a warm room in the house and never disturb them except to see that none are overcrowded and prevent smothering. As soon as all the eggs have hatched, we place the goslings out with a mother goose. We never give goslings to a chicken hen unless we are compelled to. It is hard sometimes to have a Toulouse goose become broody, as they are supposed to be nonsitters, but at the same time they do sometimes become broody, and when they do, they make fine mothers. We always try to have a mother goose to take the goslings, as they understand the nature of their own kind better than hens and grow them much better. We incubate the eggs with chicken hens invariably. Some use incubators for goose eggs, but we have never been successful in hatching goose eggs with incubators, much preferring to use good broody chicken hens.

Keep the goslings on a dirt floor. Never brood them on a board floor. Goose eggs hatch in 28 days, and they are usually well feathered before the hot sun comes to burn their backs. Late goslings often die from the sun. We never like to "break up" a goose and make her lay again. If she raises twelve goslings with a ready sale at five and ten dollars per pair she has paid her keep and more. They resent your interference and often trample the young or engage you in a scrap. The quieter they are the better.

If you must get eggs and hatch with a chicken hen, sprinkle the eggs often and go to the nest at least three times a week and turn the eggs, as biddy can not roll such big eggs. The goose takes her swim and returns to the nest with weat feathers, to wet up the eggs that the shell may soften and release them. Do not help them out of the shell. It takes them a day and night to finish their evolution and enter another sphere, so don't hurry them and find when it is too late that the obsorption was not complete. With care for the stock and the choice of bone rather than fat in the breeders it is not difficult to establish a beautiful and lucrative flock.

FIRST FEED FOR GOSLINGS.

We place the goslings out in a grassy plot prepared for them and prefer to never let them get into water to swim until they are feathered, but plenty of fresh drinking water is provided for them several times a day. Some times we feed the goslings on corn bred, but some times when grass is plentiful we feed very little else. If the grass supply is limited, then we like to feed sparingly of rolled oats, eggs, corn bread, and chick feed, made into a mash. When we have an abundance of grass, we don't feed much, as the goslings will get too fat and die suddenly.

We tried for years to feed the goslings, but they are in such a hurry at morning to get to the grass and water they leave the food untouched and at night they were so full of grass and frogs, they would apparently talk about the day's adventures and go to sleep, so we left Mrs. Goose to feed them, and she does it to my satisfaction. If we attempt to feed them at all, we feed them and handle them just about the same as we do our ducks.

We give other methods of feeding goslings for the reason that some feeds are available in one section and not in another, and one method may prove successful with one breeder and not with another.

How should goslings be fed and cared for?

"Keep them warm and feed meal, bran and a very few scraps at first. Give plenty of water, grit and shade and keep in small pens where there is short grass." Herbert L. Sweet.

"They should be fed on soft food while small, bread with a little fine gravel is best, with lettuce, radish tops and cabbage leaves for green food. Allow them a run in cloves but do not let them have water to swim in while small." F. J. Damann.

"Keep them warm and dry at night, out of the rain while young and when the weather is cold. Feed chick mash or corn meal with middlings, mixed crumbly, three or four times daily while young. Give them plenty of green forage and water to drink." Mrs. B. F. Hislop.

"Feed cottage cheese, chopped grass, lettuce, dandelion tops or other green stuff. Move the runs frequently." Frank J. Gross.

"Goslings should be fed corn meal. slightly moistened, not sloppy, and salted as you would your own food. They should be given plenty of water to drink but not allowed to get wet." John H. Worley.

"For the first few days feed eggs and corn bread, then bread and small grain with plenty of green food to eat and water to drink at all times." Frank D. Fowler.

"Goslings should not be fed until 24 to 36 hours old. After that for the first two or three days feed corn bread soaked in sweet milk with lettuce or fresh grass cut fine with the scissors, as a green food. A ration composed of equal parts by measure bran, middlings and corn meal mixed crumbly with water, feeding only what they will eat up clean, may then be given. It is advisable to mix a little sand with the food. They should be allowed a run on fresh grass." W. M. Sawyer.

"Keep them dry but not too warm. I prefer one hen mother for five goslings, in a large roomy coop. If a clipped lawn can be provided for range, it is ideal. Feed them dry bread crumbs and plenty of grass. Give them clean water with grit in it, but do not allow them to get into the water." Sara A. Little.

PROVIDE SHELTER AND PROTECTION FROM RAIN.

We make or prepare a shelter for our goslings and protect them from rainstorms by allowing them to come to the shed, which is handy and next to our goose quarters. As soon as it begins to threaten rain they are driven to this shed until the storm is over. Goslings appear to enjoy standing out in the rain with their heads up, and if not made to go into the shelter, soon fall over dead, when the shelter possibly was within a few feet of them. Outside of rainstorms, we allow our goslings to graze over the pasture at will, and they live on grass, and consequently handled in this way, they are almost all profit with but little expense except the care. During the fall, when the pasture begins to become dry, we feed raw potatoes, mangles, cabbage and turnips or anything they relish as green food.

AVOID LEG WEAKNESS AND RHEUMATISM.

In bad weather, we house our geese at night to protect them from wet and snow. They are bedded with straw, the same as the ducks. Any water fowl must keep its feet warm in order to be comfortable. When they are compelled to sit out in the open in the cold and snow, you can expect some dead geese by spring, as wet, damp sleeping quarters nearly always produce more or less rheumatism. If your geese have been well cared for during the winter, they will lay at least five weeks earlier than when exposed. The eggs will be more fertile and the goslings stronger and easier raised. While we always feed our goslings and old geese in the fall all the turnips, beets, cabbage or other green food they want, at the same time we prepare a patch of rye for their winter pasture, and as soon as the rye has made headway enough we turn them on it.

DISEASE OF GEESE AND TREATMENT.

We seldom, if ever, lose any goslings by disease. If we lose any goslings, it is by accident or they are caught by turtles or lost by some manner other than by disease. Lameness is the only and worst thing we have to contend with. Of late years, we have learned how to overcome that, and that is by not overfeeding, and never keep our geese in close confinement, nor allow them to roost on low, wet soil. Their roosting quarters are always kept dry and bedded. You will notice that if you have lameness, it seldom makes its appearance until fall, when snow or weather appears; or, should you keep your geese confined and never allow them range, they will become affected at any season of the year; but generally the lameness comes in the fall and winter, when you begin feeding and housing your geese, which is sufficient proof that lack of proper shelter or housing and improper feed, or possibly unwholesome food, is the direct cause. If we have a goose that becomes suddenly lame, we isolate it from the rest of the flock and feed light diet of stale bread, and provide plenty of water. We give a teaspoonful of castor oil and rub the joints with some good liniment. The second evening we give another dose of oil and continue to feed very lightly and keep the bird warm and comfortable. In a few days it will be improved and we turn it out on the rye patch. As soon as they get able to get out on range and feed on green foods, the trouble will soon disappear, as a rule. Geese, aside from lameness, are not subject to but few, if any, diseases. They are long-lived and will live to a great old age. We have known geese to live to be twenty-five or thirty years old. They will not lay as many eggs when so old, but the young will be very hardy and easily matured.

PREPARING GEESE FOR MARKET.

We have learned that the markets demand large, heavy, well-fattened specimens. Birds that have round, plump. fat carcasses are in great demand and will bring the top market price. In feeding geese, we always aim to get our geese good and fat and as soon as they are fat, we do not feed them longer, but put them on the market at once. We handle our market geese differently from turkeys. Instead of giving them range when preparing for market, we place them in a small lot, so that they cannot exercise but little, but prefer that they get some green grass or rye, so arrange our feeding pens so that the geese can get to the green rye or a portion of it at least. We use a trough of the V shape to feed in. Our morning feed is corn meal, oat meal, rye middlings and ground wheat. Mix it thoroughly and scald and feed while warm. At noon we feed shelled corn, all they will clean up. At night we feed ground corn, ground coarse, with wheat. Fresh water, grit and charcoal are provided constantly. Geese, when feeding for market, should have plenty of grit and charcoal. They will consume a large amount of it. Keep the quarters clean where you are feeding geese, as everything will become filthy where geese are fed unless you use every effort to keep things sanitary. Geese fatten very fast and from two to three weeks is ample time to fatten a goose. We never feed after the geese are rounded out and ready for market, but sell at once. No one can make any profit feeding after the fowls are ready for market. Then again there is danger of losing some because they are overly fat, if you continue to feed after you once get them finished.

Many growers prefer to dress their geese and ship them to market dressed in order to receive the very highest price possible, which is correct, as the producer is entitled to more profit on his product than anyone else.

METHOD OF KILLING AND PICKING GEESE.

Anyone can easily dress geese. After the weather gets cold enough to insure continued cold, you can dress and deliver to almost any market with safety. Omit feeding the night before you expect to butcher. Hang up the bird by its feet before sticking. After you get your birds all ready for sticking, take a sharp knife and insert into the roof of the mouth, well back, so that the blood will flow freely. Use the same methods as is used in sticking and killing chickens. If you wish to dry pick, it is best to only kill one at a time, but as we have such poor success with dry picking, we never recommend that method of picking to the amateur for water fowl, as the skin of a fat goose will tear in spite of all you can do. So I much prefer to steam and pick. The best method is to take a wash kettle or stove boiler and fill with about five inches of water. Take laths and make you a frame that will fit down in the kettle and stand about three or four inches above the water. Heat your water previous to killing, and continue to keep a hot fire, and as soon as your birds are dead place one or two (owing to the size and room you have) on this frame and steam thoroughly for about five minutes, not longer as you will cook the flesh. Make certain that your carcass does not touch the water. Cover the kettle tightly so as to retain all the steam. Watch your heat, and if very hot, three minutes is sufficient time to steam, but if reasonably hot, five minutes is about the correct time to steam. We rather prefer a moderate heat, and steam longer, than to overheat. As soon as the carcass has steamed enough, take it out quickly. Loop a stout string around shanks and hang to hooks prepared to receive them and of the proper height to be convenient for your pickers. Always hang with head down so that each carcass will drain well, and the blood will not soil the feathers. Pick rapidly. Have your pickers trained so that they will understand the art of picking so as to not tear the flesh. Do not hang the bird over a barrel as you do when you pluck turkeys, bpt have your barrel to one side, handy, where you can place every feather in the barrel without getting blood on the feathers. The feathers are too valuable to have them soiled and this method of dressing will insure you bright, clean feathers and a carcass that can scarcely be detected from dry picking. If there should be any down on the carcass after you have finished the picking, take powdered resin and rub over the body and place back in the steaming kettle for a few minutes. Then remove quickly and rub briskly and no down will remain. This steaming will plump the carcass and make them appear very attractive. If you should get any blood on the neck or on the carcass, take cold water and wash the blood off. Never pack with the carcass soiled with blood as it will result in a loss to you, as such consignments are always graded and sold at a reduced price. Have racks sufficient to receive your birds after being plucked, with room sufficient to receive them singly, not one bird upon another, as this ruins their shape in every instance.

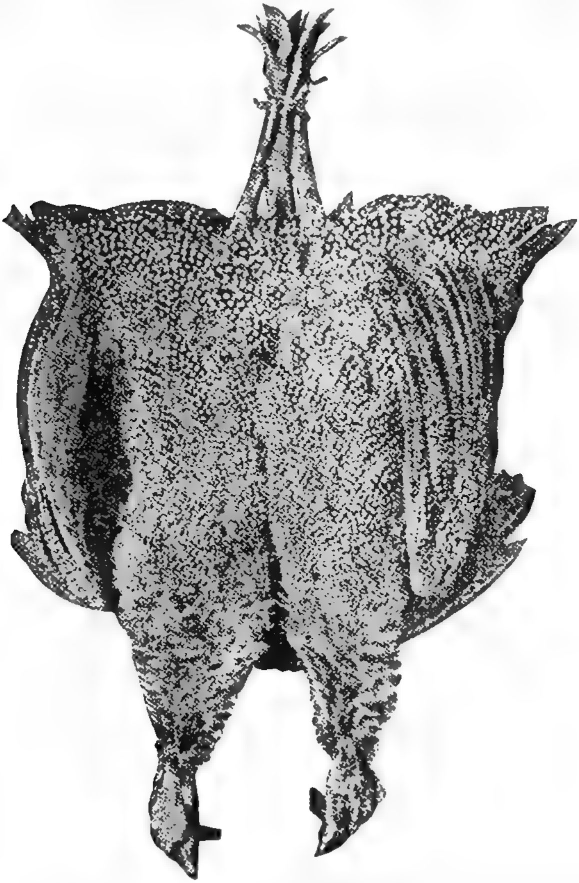
We have never drawn our market geese, as most markets prefer them undrawn, but some markets prefer them drawn. It will be best to consult your dealers to find out what is desired. Some markets do not even want them dressed, but prefer them alive and well fatted. In packing, make sure that every head remains on the body as they will not sell at all beheaded. Pack in boxes of about one hundred pounds, after full. Pack with legs and body as straight as possible. See that the carcass is not bent or twisted out of shape. Make your package as tight as possible so that there will be no shuffling in handling, as this would cause the carcass to color up and possibly ruin the entire consignment. We don't like barrels for packing geese as you cannot pack in these without getting the body twisted or out of shape. Do not make the mistake some do of packing a mixed lot. If you dress geese, have all geese in your package. If you dress any other fowls, have the packages contain each variety separately. Never mix up your packages. Get your consignments on the markets at a season or at a time when the market is most active as you will realize much more. If you ship alive, you will find that the ordinary shipping crates for water fowls used by poultry market men are the most convenient for marketing geese. See that they have plenty of water to drink while on the way, but avoid feeding as they will arrive in better condition without food. The feathers plucked from your dressed geese should be sacked and thoroughly dried before offering them on the market. If you once get into the goose industry, you will likely find it a pleasant and profitable business, as you have a double profit coming, in the shape of feathers and meat. Like any other business, it must be understood and sensibly handled in order to make it profitable.

PICKING LIVE GEESE FOR FEATHERS.

We do not pick our breeding geese only at their natural molting period. Goslings which are intended for market in the fall, should not be picked, but the small feathers of the breast and sides may be removed. It does not pay to pick breeding geese except at their natural molting period, which comes after the laying season. They may then be picked every seven or eight weeks until cold weather, if fed for this purpose. A fifteen-pound goose, if well cared for, will average one-half to one pound of feathers a year without injury to its breeding qualities. Goose feathers in most sections are worth from thirty-five cents to seventy-five cents per pound, according to the color and quality of the feathers.

GUINEA CULTURE.

There is a great amount of prejudice existing against guineas which is not deserving. This prejudice exists mainly on the ground that they have a tendency to wander away from home and become lost, or because of their noisiness. In reality, there is nothing to complain of in either of these two objections. We have grown guineas, both White and Pearl, for many years and must say that our guineas have never wandered away, neither have they been a nuisance because of the excessive noise. Guineas should never be considered as ordinary poultry for they are in class to themselves and cannot be compared with any other domestic poultry. They are naturally a wild fowl, but can be taught or trained to seek farm buildings and surroundings for their homes. They are a fowl of considerable merit. While they are naturally a wild fowl, partially domesticated, yet they still possess a pronounced desire to roam. They never roam so far but what they



—Courtesy of the Country Gentleman.

A pair of Pearl Guineas ready for market. They are used as a substitute for game and this fact is going to make a greater and growing demand for them.

will return to their roosting quarters. They appear to have a disposition to be a natural guard about farm homes. Nothing takes place about the place at night or day, without the guineas put up a shrill shriek, a distinct note of warning that there is something out of the ordinary taking place. Let a stranger appear on the place, and every guinea will at once put up a note of warning. At night, if a chicken, goose, turkey or duck makes the least bit of fuss, denoting distress, the guineas will chime in and give us notice that there is something out of the ordinary taking place. Aside from these inclinations, they are very valuable as layers, as well as for meat. However, it is not every location that is suited for guineas, as they must have a reasonable amount of range. This range, you know, is not always possible, hence guineas should not be considered if range is impossible. Freedom is important with all wild fowls. While this is true, we can better confine guineas with success and without fear of immediate danger than most any other fowl of the same nature. This spring we had a large number of young male guineas which we were holding for breeding purposes, selling to customers as rapidly as possible, but as the guinea mating season comes later that with almost any other fowl, we are always compelled to hold them later than other fowls. Consequently, we were compelled to yard in a lot only 24x32, with comfortable house conveniences, and these cockerels on the day we disposed of the last one, which was late in May, were as vigorous and as active as if they had been ranging over a thousand acres of land. We cannot handle turkey cockerels in this manner, so guineas, after all, can be confined to a certain degree with better success than almost any other naturally wild fowl. You cannot confine the breeders any great length of time and count on good hatches. We confine or pen our breeders sometimes for certain reasons in order to improve the matings, but we manage to liberate them some part of the day for exercise and do not experience any bad results. In a general way, guineas should have freedom. The more liberty they have, strange as it may appear, the less desire they have for wandering away from home. We know personally of several flocks that were forced to limited range, which would, when permitted to range, leave home entirely in order to get freedom. Where they have freedom, they will invariably come back to their proper quarters.

BEST LOCATION FOR GUINEAS.

The most suited place for guineas we find is a large orchard near your houses. The garden is a desirable place for guineas and is much appreciated by them. Guineas will not scratch or eat of the fruit, as you might suppose, but will quietly creep along the foliage of the plants, ridding the plants of many deadly insects. They see every bug and insect that makes its appearance. They want to be where they will not be molested. Last season we had a pair of guineas range in the garden all season. The hen made a nest under a large rhubarb leaf and laid a full clutch of eggs and incubated the eggs and brought off a fine drove of pretty guineas that lived off of the garden insects all season. The insects which they permitted to live were mighty few as every cucumber vine was raided every morning the same as all other plants, and a finer garden was seldom seen. We placed a fountain of fresh water in a convenient place for them in the shade. They soon learned its whereabouts and from all appearances they thrived and did as well as we could have desired.

EXCESSIVE INBREEDING DETRIMENTAL.

Guineas are the least trouble of all fowls. They are self-supporting. Guineas, like ducks, are easily weakened by inbreeding, not to such a degree as it affects chickens, but about the same as it affects water fowls. They are inbred more perhaps than water fowls, which has a tendency to cause many flocks to be low in vitality. We are very careful to not tolerate inbreeding in our matings. We cannot mature the chicks where the matings have been excessively inbred. The young will appear very delicate, where inbreeding is tolerated, therefore new blood should be introduced at least every second year. Where guineas are non-related, the progeny is very hardy and matures rapidly.

SELECT THEIR OWN FOOD FROM THE RANGE.

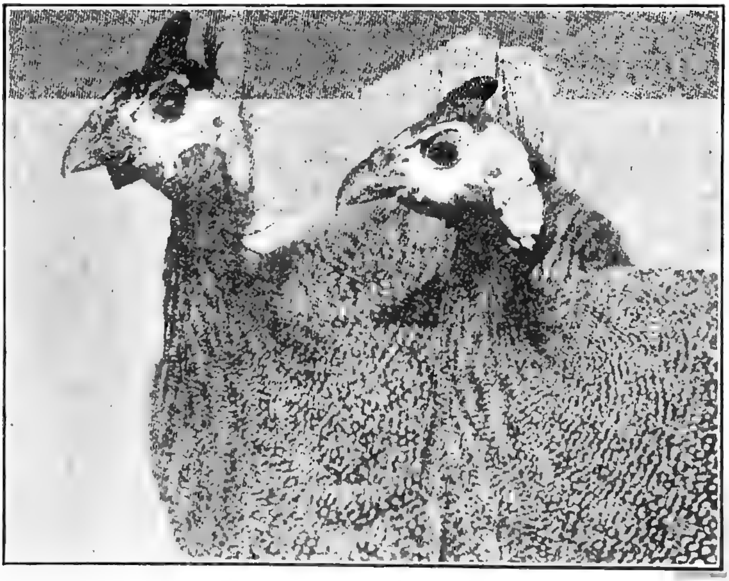
They prefer to select their own food from the range, as they live chiefly on insects, worms and wild seeds just the same as turkeys. If we feed guineas freely they soon contract indigestion just the same as a turkey, and die. Always allow them to feed on natural foods. If they are fed at all they should be fed about the same as chickens but not so freely.

DISTINGUISHING THE SEX OF GUINEAS.

It is quite a difficult matter for an amateur to distinguish a male from a female guinea fowl. Breeders have been known to unknowingly market all of the females or all of their males and then have nothing left except birds of one sex. The male has a somewhat larger helmet and wattles and coarser head, but a more positive method of distinguishing the sex is by the cry of each bird. The females seem to say "Buckwheat, buckwheat, buckwheat" while the shriek made by the male is decidedly one syllable. When the guineas are excited both male and female will make practically the same cry, but at no time does the male seem to say "Buckwheat, buckwheat, buckwheat." This difference in the male and female can be distinguished most any time after the birds are two months old.

GATHERING THE EGGS.

The guinea hen will always make her nest in some secluded spot. If you visit her nest and touch the eggs the wild nature of the bird seems to cause her to stop laying in that nest and she will take up a new one in some other spot. Therefore, some recommend either leaving the eggs in the nest or if you wish to incubate them under chicken hens or in an incubator they should be removed with a spoon and the nest should not be touched or disturbed. After the eggs are removed a few nest eggs must be left in their place. It is usually best to leave at least a half dozen eggs in the nest to prevent the hen from seeking a new nest.



Distinguishing the sex of Guineas. You will notice that the helmet and wattles of the male on the left are larger than those of the female on the right. (Courtesy of Andrew S. Weiant, Bureau of Animal Industry.)

BEST METHOD OF BROODING.

We have read many letters from supposed experienced guinea growers, that advocate many things that were always disastrous to use. There is one theory advocated by many growers, about how to brood guineas. Some writers say the best method is to brood them in brooders, a method that has proven a complete failure with us. Another method is to brood them altogether with the natural guinea hen, which is an improvement over the artificial brooder, but a method with which we could never have any success. We have used each method and have arrived at the conclusion, after several successful seasons, that the chicken hen makes the best guinea mother possible, except the turkey hen. But as it is impossible to have a turkey mother at all times with the guineas, we advocate the use of chicken hens over the natural guinea mother or the artificial brooder. Our reasons for advocating this method is based on the fact that whenever we attempted to grow guineas with the natural mother, she traveled too fast and did not hover them as often as she should. If guineas are brooded in a place like a garden, then we could use the natural guinea mother, but where we are compelled to give them the liberty of the farm, we find the guinea hen travels too fast for them and fails to hover them just at the proper time.

Again, the natural mother will go up in the trees to roost entirely too early for the guineas. We have seen mother guineas go up in the trees to roost before the baby guineas were able to fly, hence the little fellows would all be dead the next morning. A chicken hen will not do this. The only place we could ever raise guineas with the guinea hen was in the garden on the lawn. The guinea must have abundance of brooding, much more than the natural mother is willing to give, owing to her great eagerness to range. The chicken hens will hover them carefully two or three days and then when they start out with them will not go far nor any great length of time without stopping to hover them. Our several hundred head of guineas are raised with the chicken hens, except those that are incubated by the natural mother in the garden, or in the cultivated berry patch. In such instances, we let the natural mother brood them, for in these places they cannot range far, while at the same time they have plenty of insect life to live on and will mature quite as well as those brooded with chicken hens.

We are aware that some writers claim that to raise guineas with chicken hens is not the best manner. What difference does it make what method you use, just so you meet with success? If the brooder, either the fireless or the heated brooders, proved the best, we would use them and recommend them, but when they do not and years of experience with every method known demonstrate real facts and establishes the hen method to be an absolute success with us, we are going to use it and freely recommend it. When we give the baby guineas to the chicken hen and allow them to forage for a living, it is the best method to use, we will venture to say, nine times out of ten.

MATING, FEEDING AND CARING FOR THE YOUNG.

As guineas lay only in summer, it is useless for us to give any set rules for feeding for egg production, because a guinea will lay if she has range and food, when the period or time of year approaches. They are like the the flowers that bloom. When the time of year comes for flowers to bloom, they are going to bloom, regardless of certain inducements that may be attemtped in order to induce them to bloom before the season appears. Same is true of guineas. You might feed all the good egg foods known during the winter months and the guinea would continue to be indifferent. It might be possible, however, that certain modifications in methods of handling and breeding might in time induce winter laying with guineas. The feed, we find, has but little to do with inducing guineas to lay. They are a natural forage bird and get every necessary element to satisfy their wants and will lay about the last week in March if the weather becomes mild and favorable. They make very poor sitters, being entirely too restless and will not usually sit on the nest sufficiently long to incubate the eggs, especially early in the season. As the season advances, and the weather gets hot they will then consent to sit and will frequently remain on the nest until the hatch is completed.

NUMBER OF MALES TO FEMALES.

We mate from two to three hens with one male and find we get quite as satisfactory hatches as when we followed the old method of mating in pairs. It is a mistaken idea that guineas must be mated by pairs in order to get satisfactory hatches. We get very fertile eggs all the time and mate from three to five frequently with one male. We would not like to go beyond this number as the per cent of fertility would be very apt to run low.

INCUBATION, BROODING AND FEEDING.

The period of incubation of guinea eggs is about the same as turkeys, twenty-eight days. Guineas when first hatched are not more than half as large as chicks, but show great vitality just as soon as they leave the shell. Unless you keep close watch on them and have the nest very deep the little fellows will jump out of the nest and run off or be destroyed by cats or other enemies. We make very deep nests for our guinea eggs and as soon as they hatch, remove them from the nest and place in baskets and cover them over very snugly in order to keep them in. We set from four to five hens at a time and give the chicks to about two trusty old hens. We place their brood coops in a safe location away from other fowls as a guinea is just like a turkey and when young will follow most any fowl. As guinea roosters are fierce on baby guineas that are brooded with chicken hens, we watch to keep them out of the brood pens. They catch them just like a crow and fly away with them. Why they do this is a puzzle to me, as a guinea cock will fight until they die for the young when brooded with the natural guinea mother. We do not feed the little fellows a thing for thirty-six hours and then it is a very small amount of wheat bread soaked in sweet milk, and seasoned with black pepper. As soon as the chicks are able to run, we turn them out in the park with the mother hen and feed sparingly on commercial chick food. We give them water just the same as chicks and see that they have plenty of grit.

When the guineas begin to feather, the chicken hen attempts to "wean" them, but she has an everlasting task on her hands. Last season, the hens did every possible way to get rid of the little pests, but could accomplish nothing. When they began to lay again, the guineas would go on the nest with them and sit down around her perfectly contented until the mother left the nest again. One old faithful hen, after she had used all the skill she had and attempted to lay and see life again in real chickendom, gave up in despair and took to brooding the guineas again and remained with them all winter long. Wherever you saw that hen, you would see the entire clutch of grown guineas, with her or near, so that they could come to her assistance at the first approach of danger. The great boldness and snap of the guinea is what makes them so valuable.

GOOD SUBSTITUTE FOR GAME.

They are among the finest of table fowls. When they are dressed properly, either young or old, and baked slowly, they are just about the best flavored meat of any domestic fowl. They resemble wild game and are now in demand in the best hotels and cafes as a substitute for game.

FINISHING AND MARKETING GUINEAS.

The demand for guineas has increased so rapidly in the city markets that all efforts to supply this demand has failed. The stringent game laws now in force make it impossible to supply the hotel trade with game meat, hence, the guinea meat comes so closely to the game in flavor that the hotel trade for the well fatted guinea has become great. The flavor of the guinea cannot be detected from many of the highly prized game birds, hence, they furnish an excellent substitute for game birds and are in great demand in many Eastern markets. The general method of preparing the guinea for market is practically the same as that used in preparing any other fowl for market. The guinea fattens more readily than any other fowl raised in confinement and great care is used not to have these birds overly fat, or so fat that the flesh, when dressed, is easily torn. You should find a private market if possible for guineas as that will afford you a much better price.

Almost any high class hotel or cafe will use them and at a fair premium over domestic fowls, if delivered in prime condition and well fattened. The palatability of the guinea is no longer a question. The flesh is highly relished by almost every lover of game flesh. Guineas when dressed have purplish colored flesh, hence, this color is expected and is no barrier on the market. While the color suggests staleness, yet with those that understand this, they look for the natural color and for a gradually lighter color than this if stale. In Europe, guineas are very popular at the leading hotels and are grown in great numbers over a large area of European countries.

MARKETING DEMANDS WILL INCREASE.

We dress guineas for market just the same as turkeys, and pack in boxes. New York buys freely in the fall and ships to England and parts of Europe. There is no real good market in the West for guineas at the present. It is due to the fact that the West gets sufficient wild game to supply the demand. However, the man that will grow a good flock of guineas, will find a good market in the East. The guinea egg is sought after in the Southern and Eastern markets. The Southern cooks always select guinea eggs for cakes and similar purposes if they can get them. Here in the middle west, guinea eggs are not popular, but as the years pass, the demand will become more and more in favor of guinea eggs as they are very highly flavored and are absolutely free from any taint caused by eating filthy food. There is no fowl living that is as clean about their eating as guineas. You will never get a guinea to eat anything but the very best foods; hence, their meat and eggs are always highly flavored. Guineas will come more appreciated here in the West as people learn more of their food value. Some people really think a guinea is not fit to eat because of their flesh being dark, but such individuals are evidently laboring under false impressions, as the better class of people in the East select a guinea for a fancy dinner in preference to any other fowl. Of course, during festive season, there is nothing that can be substituted for the lordly turkey, but almost any other time the guinea comes in as a special and highly prized fowl to make up the choice meats to be served to fashionable guests. When shipping guineas to market, always have your consignment to appear in the very best possible condition as the appearance adds much to the selling value and at the same time indicates that the fowls have been fed and finished in a first class condition. Always market your broiler guineas early in the summer as they will bring the best price at that time, but fatten the old specimens in the fall and offer them then. If you do not care to dress your guineas, ship alive and see that the crates are roomy and equipped with watering devices and just a little feed. We do not like to feed very heavy when we ship alive, as the fowls will go through in much better condition when shipped "lank," but give plenty of water. It must be remembered that the guinea is a tropical fowl and cannot stand severe cold weather. Get your guineas off to market before severe weather sets in and you will have them in better condition and avoid having them chilled in shipping.

With proper care and management, you can grow guineas in large numbers and market at a great profit as they are largely self-supporting and will cost you but little until you begin to finish for the markets. The finishing cost will be comparatively light if the fowls have had free access of range, but to have them plump and the flesh highly flavored, we like to feed them about ten days on corn and wheat, which puts them in fine condition and gives the meat a much higher flavor and makes it slightly more tender and juicy.

GUINEAS.

There are five important things which should be remembered in the raising of guineas.

1. Young guineas should be kept in dry quarters or where they can be protected from the storm. Mature fowls do not suffer from the rain or seem to be affected by it.

2. Provide an abundance of water. They drink a great deal.

3. The young cannot withstand too much sunshine, or too much cold. They must have shade and be comfortable.

4. Avoid frightening them. They don't forget a fright very soon. Catch them only at night and then only to treat them for lice or to examine them.

5. Young guineas are continuous feeders and therefore should have food given frequently instead of starving and then feeding too much at one time, for there is danger of them gorging themselves, and indigestion and death will result.

CROSSING GUINEAS AND CHICKENS.

Guineas can be crossed with the ordinary chicken. You can mate a guinea cock bird with one or more hens in a pen where they can have plenty of range and not be disturbed, or you can mate a vigorous cockerel of any of the American varieties of chickens similar in size or smaller to one or more guinea hens. If they are surrounded by natural breeding conditions and are not disturbed, they will mate and the cross will have the shape of the guinea with guinea head points, and much the same voice of the guinea, but will be much larger in size. The flesh is very fine and the body of the bird is very plump.

DUCKS.

1. What are some of the advantages of the duck business?

2. What sort of a location is suited best for duck raising?

3. What age ducks and drakes should be used for breeders?

4. In what way is a body of water beneficial to ducks?

5. Give a good ration for the breeding ducks.

6. If duck eggs are hatched in incubators, what is required that is not required in hatching chicken eggs?

7. Why is it necessary to have a deep drinking vessel?

8. Why should you introduce new blood in the fall?

9. What are some of the most common diseases with ducks? Name their Causes.

GEESE.

10. What number of females should be mated with each male?

11. Is it best to start with stock or eggs? Why?

12. Why can a goose be kept so cheaply?

13. What is best method of incubating goose eggs?

14. Should we brood the goslings with a chicken hen, an artificial brooder, or with their natural mother?

15. Should they be incubated, brooded and fed much the same as ducks? If not, wherein is the chief difference?

16. How should geese be fed when fattening them for market?

GUINEAS.

17. What particular food value have guineas?

18. What should mature guineas be fed, or should they be kept on range and allowed to select their own foods?

19. What is considered a good method of hatching and brooding the young?

20. Mention briefly five important things which should be borne in mind in raising guineas.

INDEX

TURKEYS

Page

Black Head 19-22
Breeding Stock of Greatest Importance 3
Brooding Young Turkeys 15

Caponizing Turkeys 24

Diseases of Turkeys 19

Eight Vital Points to be Remembered in Raising Turkeys 1

Fall Feeding and Care of Turkeys 15
Feeding the Breeding Stock 4
Feeding the Poults 11
Feeding the Young Poults 12
Fertilizing the Eggs 6
Food and Management of Young Turkeys on Either Large or Limited Range 11

Gathering the Eggs 8
General Treatment for Turkey Ailments 22

Helen Dow Whittaker's Feeding Suggestion 13

Keep Turkeys in Small Flocks 19
Keep Young Turkeys from Oat Fields 23

Lice Are Death to Turkeys 15

Management of Layers and Care of Eggs 4
Mating Turkeys 1
Most Critical Age in Turkeys 24

Nesting Places for the Layers 6
No Housing Required 18
Nothing Succeeds Like Success 3

Preventing Colds 19
Proper Feed and Care for Half Gorwn Turkeys 13
Provide for Range 15
Provide Nests Before Laying 7

Questions on Turkeys 25

Roosting Sheds for Turkeys 17
Roup 22

Selection is Important 3
Selection of Females 4
Setting the Hens and Hatching the Eggs 8
Standard Weights of Turkeys 2

Ten Commandments for Prevention of Turkey Diseases 23
To Prevent Ranging Too Far 6
Treatment of Turkey Diseases 23
Turkeys Need Range 6

What Is a Desirable Breeder? 4

DUCKS

Advantages of the Duck Business 28
Aylesbury and Cayuga Ducks 39

Bad Results in Over Feeding 29

Comfortable Quarters for Stormy Weather 30

INDEX (Continued)

Demand for Duck Eggs 29
Ducks and the Potato Patch 36
Duck Diseases 40
Ducks Do Not Require Much Brooding 36
Duck Industry, The 26
Ducks Require Green Food 30
Duck Rations 32

Easy Method of Dressing Ducks 41

Feeding Breeders for Fertile Eggs 29
Feeding Ducklings at Various Ages 33

Houses and Housing 30

Incubation of Duck Eggs, The 35
Indian Runner Ducks 39
Introducing New Blood in the Fall 40

Keep Strangers from Breeding Pens 36

Location for Ducks 28

Muscovy Duck, The 38

Pekin, The 38
Pointers 36
Popular Varieties 37
Proper Age for Breeding Stock 29
Proper Age to Market 36
Provide a Deep DrinkingVessel 36

Questions on Ducks 59

Results of Careless Methods 37
Rouen Ducks 37

Test in the Incubating of Duck Eggs, A 36

Water for Ducks 31

GEESE

African Geese 44
Avoid Leg Weakness and Rheumatism 49

Best to Start with Stock 46

Canadian, or Wild Geese 44
Care of Goslings—Incubation and Brooding 48
Chinese Geese 44

Determining Sex of Geese 45
Diseases of Geese 49

Egyptian Geese 45
Emden Geese 43

First Feed for Goslings 48

Number of Males to Mate With Females 45

Picking Live Geese for Feathers 51
Preparing Geese for Market 50
Principal Requisites for Geese 47
Profitable Geese Growing 41
Proper Age for Breeders 45
Proper Location 47
Provide Shelter and Protection from Rain 49

INDEX (Continued)

Questions on Geese 59

Range Necessary for Geese 46
Rye Pasture 47

Toulouse Geese 42

Yearly Cost of Keeping a Goose 46

GUINEAS

Best Location for Guineas 53
Brooding 54

Crossing Guineas and Chickens 58

Distinguishing Sex of Guineas 54

Excessive Inbreeding Detrimental 53

Finishing and Marketing Guineas 56
Five Important Things to be Remembered in Raising Guineas 57

Gathering the Eggs 54
Good Substitute for Game 56
Guinea Culture 52

Incubating 56

Mating, Feeding and Caring for Young 55

Number of Males to Females 56

Questions on Guineas 59

Select Own Food From Range 54

Fitting and Exhibiting Standard-Bred Poultry

BY T. E. QUISENBERRY

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INTRODUCTION

The poultry business might well be defined as having two distinct branches, i. e., the breeding and production of fowls designed to closely approach the requirements of the American Standard of Perfection, and the breeding and production of fowls especially for market and heavy egg laying. We, by no means, mean to convey the impression that the breeder of Standard fowls is not also particular as to his flock's ability to produce. On the contrary he is, or at least should be, a careful student of that important factor in breeding.

If a breeder has become quite proficient in the production of a variety, so that a large portion closely approach Standard requirements, his fowls will then usually be successful in the fall and winter exhibitions, thus gradually building a reputation for his strain as one which produces high standard quality. This reputation made by a breeder's fowls, if taken advantage of by the breeder and properly advertised, creates a demand for his surplus males and females at prices well above the value of fowls for table use. The same is ture of the hatching eggs his fowls produce during the entire hatching season. Thus such breeders gain their principal income from the sale of birds for breeding and exhibition use, and from hatching eggs or baby chicks, usually having commercial eggs for market only during the summer and fall months.

The other branch of the business, which is made up of those producing fowls for market and heavy egg production, consists of the vast majority of farmers' wives on the average farm of the Central States and the commercial poultrymen who are generally found devoting all of their time and considerable acreage to poultry, plus being in the business on a large enough scale to enable handling several hundred or thousand females for egg production throughout fall, winter and spring.

Strictly commercial poultry farmers depend very largely upon eggs and poultry sold for table use as their principal source of income. Breeders, who are raising poultry in their back yard and one or more vacant lots, or as a side line, utilizing only a portion of their time—their main business being of another nature entirely—would usually do much better and derive more pleasure if they would strive to build up a family of some one variety and perfect it until the greater portion of each season's crop of youngsters closely approach Standard requirements. Such breeders would gain more headway by a sincere and thorough effort to breeding for increased egg production at the same time. Breeders of this class do not necessarily need to feel the necessity of a large volume of production each year, and will be the gainer after a few years if they will use the theory of restriction and elimination very vigorously during the season for selecting breeding fowls. In all matings, only fowls should be used for breeding which very closely approach Standard requirements, and which, by their carcass measurements, prove that they have the ability to produce a profitable number of eggs annually.

To gain the full benefit to be derived as a result of breeding fowls close to the Standard requirements, a breeder must place the best birds he is capable of breeding and developing on exhibition at all fairs and winter poultry shows. The larger the exhibit the greater will be its reputation for being a show consisting of birds of high quality, and the greater will be the advertising value of a winning record made at such an exhibit. These lessons are, therefore, intended to assist the breeder in training, developing, feeding and preparing his birds for exhibition, as well as to enable him to handle them to such advantage as will assure them reaching the show room and being in the best of condition when awards are to be placed by the judges.

A breeder's ability to properly accomplish these things, most generally, means the difference between success or failure in the business of producing Standard-bred poultry for breeding and exhibition. We have known hundreds of cases where the difference between first and second awards, or, for that matter, between first and fifth awards to represent only a difference in the owner's ability to properly condition, train and exhibit his birds.

THE EXHIBITION

Chapter 1

In our lesson book on "Poultry Clubs and Organizations" we deal quite generally with associations organized primarily for the holding of annual exhibitions, and we explain in detail many important factors for consideration regarding the show room and the management of exhibitions. The breeder in deciding where and when his fowls are to be exhibited must carefully consider the exhibition, its reputation in its own community and among the breeders in the territory from which he has the right to expect his future trade for stock and eggs.

In considering exhibitions, one very important item is the show room. It should have a neat, wholesome and attractive appearance, thus inviting a liberal attendance of the better class of agriculturists and townspeople. It should have splendid ventilation, without having drafts which would prove injurious to the health of the fowls. It should be capable of being slightly warmed uniformly, without some birds being too cold while others are in close contact with the heat, creating the possibility of placing them out of condition and causing dissatisfaction among exhibitors and a loss to yourself. You run an even chance with other exhibitors of your own birds securing an undesirable location within the show hall.

The show hall should be lighted and so arranged that an abundance of natural light can be alike insured to all exhibitors. The room should be wired with the best of electric lighting, thus permitting evening visitors to view the birds easily and to the best advantage. Many new breeders are created and many new customers secured from among those who are able to attend these exhibitions only during the evening. There must be ample floor space to permit the cooping of the entire exhibit, and still leave aisles at least four feet wide. The building should be conveniently located so that town and country folks alike may visit it without loss of much time in going to and fro.

In most cities or small towns there are usually one or more prominent buildings, auditoriums or halls which have a reputation for housing the best affairs of this kind. Such buildings should always be obtained for poultry exhibitions, when possible. If poultry exhibitions are held in such places, its reputation as a show hall usually goes far toward insuring a successful attendance at the exhibition.

Buildings used for poultry exhibitions should never be firetraps. We have known of one or two occasions where a building, containing the greater portion of the best bred fowls in a community, burned, thus proving a serious set-back to the poultry industry in that section.

A building containing a room for exhibition use which is slightly longer than it is wide, with an entrance practically in the center of one end and good light coming in from each side of it, usually permits of a wide aisle running lengthwise through the center, while the row of exhibition cages may run from this wide center aisle out to within a few feet of each side of the building. This arrangement permits the flow of visitors to come in during the rush hours with very little, if any, congestion, and they can go immediately to the aisles containing any particular variety in which they are interested. At the same time it affords, as a general rule, the best uniform light for practically all exhibits. Birds on exhibit in shows using this method of coop arrangement are usually insured more uniform comfort and are not as likely to be in a draft as the result of the continuous opening and closing of the entrance door.

The building should be be of such size that it will permit of a wide center aisle, with cross rows on each side of the center sufficiently long to permit the average double row of cages to handle all birds entered of one variety, without double decking the exhibition coops. Double decking is a practice employed by show managements only through necessity and on account of show halls being too small. Birds shown under those conditions seldom ever appear at their best. The judge is forced to look at those in the upper deck and see nothing but breast, shape and underline, whereas when he looks down upon those in the lower decking he sees mainly their head points, general profile, breadth and length of back, etc. It is found that the same light seldom reflects upon the color of those shown in the upper deck as upon those directly beneath in the lower deck. This often creates a hardship upon the judge and tends towards a possibility of slight errors in his decison.

SHOW MANAGEMENT

Chapter 2

Before deciding upon the exhibit in which he shall enter his birds, the breeder might well take into consideration the management of the various poultry exhibitions. Sanitation is, above all other things, the most important consideration. Some show managements pay very little, if any, attention to this important part of conducting a successful poultry exhibition.

Where poultry associations furnish the exhibition cages and drinking fountains, the management should thoroughly spray and disinfect these articles of equipment. During the week of the exhibition some good deodorant and insecticide should be sprayed upon the floor of the cages and about the aisles each evening after the closing hour.

Unhealthy fowls should not be permitted entrance to the show hall. Fowls which contract diseases or sickness of any nature during the life of an exhibition, should at once be removed from their allotted place and exiled in a different room or hospital section. It is often advisable for such specimens to be returned immediately to their owners.

The bedding used in the exhibition cages should be changed every other morning. The attendant in charge of feeding and watering should understand his business and be careful not to slop or spill water on the floor of the cages. Cages bedded with medium coarse sawdust chips or clipped shavings are decidedly more sanitary than those bedded with hay or straw. Sawdust chips act as an absorbent for the droppings or for any water which might become spilled upon the floor of the cage.

Many white birds have their breast feathers and lower fluff feathers badly stained and discolored, as a result of droppings adhering to hay and straw, which causes them to appear at a decided disadvantage. This is less likely to occur where coarse sawdust is used for bedding. Many exhibitors object to the coarse sawdust chips for bedding on the theory that their fowls consume too much of it for food; nevertheless, the fact remains, that the leading exhibitors of the world, including New York, Chicago, and Kansas City, use this style of bedding. The best breeders of our country, now accustomed to sawdust, would raise a storm of protest should managements of these shows go back to straw for litter.

Metal receptacles should be provided for grain and water. Feed should never be thrown promiscuously upon the floor of the cage.

Whole and well sifted cracked grains should be used for feeding fowls on exhibition. The amount provided should be ample, but care should be taken not to overfeed. As a general rule, a medium sized handful of grain early in the morning and another about six o'clock in the evening will give the best results. This should always be put in the special receptacle provided for that purpose. Should the party in charge of the feeding find a quantity left from the previous meal, it is best not to give much additional, if any, at the time. Succulent green feed should be furnished every fowl on exhibition, at least every other day.

Show managements should have a rule, and insist upon it being rigidly practiced, whereby judges are permitted the unhampered and sole usage of the aisle containing the class on which they are working. All visitors should be barred from that section until the work of judging has been completed. This will expedite and hasten the placing of awards and insure against mistakes due to the judge's mind being taken from his work by breeders and spectators.

Show associations known to have a superintendent and assistants with a reputation for speed and accuracy and, also, for the careful checking and receiving of all exhibits from express companies, as well as for thoroughness in shipping home all exhibits, should receive more consideration from exhibitors than if this were not their practice.

Associations having a live wire secretary and press agent, who tend strictly to the duties of their office, who are thorough and accurate in recording all awards, and who are efficient in securing as much publicity for the awards of the exhibit as possible, should, by all means, be given a preference.

Exhibitors are the gainers where the judging is completed on the first day, and the award cards or ribbons placed upon the cages and the announcements of the decisions made to the public without any great loss of time. The public includes the prospective purchasers of hatching eggs and baby chicks. More sales of stock will be made in the show, and more orders for eggs and chicks will be booked, when awards are made and announced quickly than would otherwise be the case.

The entrance or exhibition fee, charged by poultry show organizations, is of more importance than is usually thought for. We find, where the entrance fee is so large as to dispease some exhibitors, that the reputation of the show as one where uniform high quality is found is greater than where a smaller entrance fee prevails. This adds value to a winning made at such an exhibition.

The premium money should not be considered of as great importance as the reputation that the association has for annually bringing out good classes, containing choice quality. After all, the object in exhibiting is to make a reputation for your fowls, so as to increase the likelihood of obtaining desirable customers who are willing to pay the true worth of your birds, eggs or chicks.

POULTRY SHOW ORGANIZATION

Chapter 3

The permanency of an organization lends value to a winning made at its annual exhibition. Unless an organization is founded upon strict business principles, unless it is largely dominated and controlled by men and women of known integrity and efficiency, and unless the conduct of its affairs and the management of its exhibitions are based upon a profit making basis, then such organizations and exhibitions are short lived.

It is of great importance to you as an exhibitor that an association be able, each season, to meet all its obligations and thus continue in existence, than for you to receive a slightly larger premium check. Though you exhibit at a certain exhibition but once, just so long as the organization continues to live and hold an annual exhibition, the record of your fowls, made during a previous season, remains alive, and is of much greater advertising value than would be the case if the annual exhibitions of that association were to be discontinued.

The officers should have business ability, and should be men and women of even temper, pleasing to meet and willing workers They should be very closely affiliated with the Standard-bred Poultry Industry. They should be people who are capable of securing financial support from the citizens of their community, their county or state government, and capable of securing a patronage for their exhibitions which will insure its financial success.

PRODUCING EXHIBITION QUALITY

Chapter 4

Exhibition fowls are usually the result of efficiency in mating and breeding, in the housing and feeding of parent stock, and in the hatching, brooding and rearing of youngsters. This takes in the broad field of feed, water, ventilation, soil and other conditions surrounding the youngsters from the time they are baby chicks until they are prepared for the exhibition cage. Health and vigor in the parentage is the first and principal requisite. Without this as a foundation, the breeder is handicapped, regardless of what other exterior and apparent quality the parent stock may have. We shall not endeavor to go thoroughly into the subject of egg production or rearing of fowls more than is actually necessary, leaving that to our other books and lessons directly pertaining to that branch of the work.

It must be remembered that "like begets like" in the breeding of fowls only when extreme care has been taken in mating the blood lines back of one's fowls for many generations to insure against the existence of any foreign or undesirable qualities in a more or less dominant form.

If the practice of rigid selection, the restriction of all fowls with any decidedly undesirable qualities, has been practiced for several generations; if the health and vigor of a family of fowls are maintained and improved upon, and if care and discretion has been practiced in breeding only from fowls fully developed to maturity and known to have attained this development within a certain length of time, without showing backwardness in the growing of flesh, bone or feathers, the chances are then greatly in favor of the poultryman producing a large per cent of chicks, which will develop into birds possessing Standard qualities to a high degree.

To raise and develop fowls of a desirable quality, chicks must be well hatched. It is more profitable to rid a brood of any apparently weak chicks during the first ten days or two weeks, than to endeavor to keep them longer. The slow growers seldom, if ever, make fowls of good exhibition or breeding quality.

THE ADVANTAGE GAINED FROM EXHIBITING

Chapter 5

The poultry exhibition is the main factory in maintaining the Standard-bred poultry industry at its present high peak. Poultry breeders in general, and particularly the smaller ones, apparently fail to appreciate the value of exhibiting their birds at some poultry exhibition, either large or small.

If one is breeding to produce show or Standard-bred stock, the poultry exhibition is the necessary basis of advertising. One cannot expect to sell choice, Standard-bred fowls, unless they have proven their quality at some poultry exhibition. One cannot advertise such stock effectively and successfully, unless a show room record is the basis of the advertising.

Doubtless many will disagree with me in this respect, but, I dare to repeat, it is the poultry exhibition that is holding the poultry industry in its present high esteem. I have arrived at this conclusion after studying the past history of breeds and varieties and from observations and experiences and by a thorough study of present day conditions. It is almost beyond contradiction that when a breed or variety has failed to hold its own in a show room, it has gone down, and gone down quickly. On the other hand, when that breed has witnessed renewed activity in the show room it again rapidly gains prestige among the producers of commercial poultry and eggs.

We, of course, admit that it is the breeds and varieties, especially in the agricultural sections of America, that have proven unadapted to heavy egg production or to rapid growth for broiler meat, which have first lost their popularity in the show room. We must also admit that a very large per cent of the poultry breeders of America, those, at least, who are breeding a good quality of Standard-bred fowls, became interested in good poultry through a visit to some show room.

It is my idea that the constant striving for an ideal in the show room has brought uniformity for the breeder who likes to style himself a pure "utility" breeder. Uniformity in all parts must necessarily include size of body, size of eggs, color and texture of eggs and a hundred other items that must be considered in the successful utility plant.

Constant breeding of fowls up to the Standard of Perfection has brought to the Leghorn its high record as a layer of pure white eggs of established size. The ideal or box-car shape, and the uniformly Standard red color has made possible the popularity of the Rhode Island Red; so it goes with all of our popular breeds that are so constructed to likewise be of practical value.

For the market we must have uniformity in size and color. The day of little eggs and big eggs, white eggs and brown eggs, all in the same crate, is a day of the past. It is the breeding to the Standard of Perfection, and the exhibiting of the product of our efforts in poultry shows that has brought this about.

It is presumed that the reader is essentially interested in high class, Standard-bred stock. It is presumed that he will have surplus breeding birds, exhibition birds, baby chicks and hatching eggs for sale. This being the case, he must build a reputation for his fowls; he must prove their quality in the show room, in order to get the true worth of his fowls when he markets them for any other purpose than table use.

It requires more than the winning of "blue ribbons" in order to make a success of selling fowls and eggs at a profit. I know of breeders who have made fortunes out of winning a few blue ribbons at some of the world's greatest shows. I know of other breeders who could not turn a million blue ribbons into ten cents worth of business. The value of winnings at all shows is the same to all exhibitors at the moment the judge awards the ribbons, but from that moment the little piece of ribbon means something else entirely. What is to be gained by the ribbon depends entirely upon the breeder and his ability in "cashing in," so to speak, upon the reputation which this ribbon symbolizes. On the other hand, much depends upon whether or not the exhibitor in question is a real breeder, whether or not he really has the knowledge of how he produced the bird that won this ribbon, or whether in the future he is going to be able to maintain this standard of quality, generally, in his entire flock, and among the birds which he sells to his customers.

SELECTING FOWLS FOR EXHIBITION

Chapter 6

The most important work, perhaps, towards making a prize winning record is the proper selection of the fowls prior to the show. Very often novices at breeding and selecting exhibition poultry leave some of their very best birds at home, or they fail to exhibit at all, feeling that their own birds are not of sufficient quality to stand a chance in competition with the birds exhibited by larger and, perhaps, better known breeders.

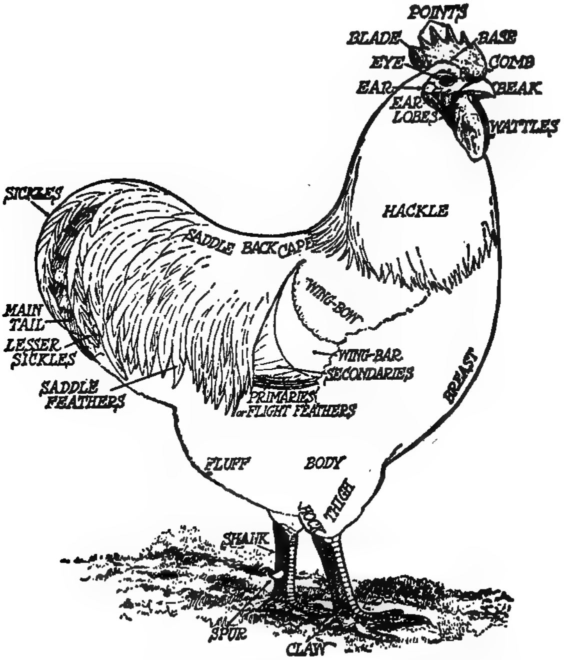


Fig 1.

Many of the terms and expressions used in this lesson will be more or less misunderstood, unless we can make things plain in advance. This illustration gives a partial nomenclature of a fowl. It shows the different sections and the proper terms or names by which they are commonly known.

To succeed in the show room, or in the work of breeding good exhibition poultry, a breeder must have a thorough knowledge of the Standard requirements which cover his particular breed and variety. It is not our purpose in this lesson to undertake the teaching of the Standard requirements of any particular breed or variety, but we do deem it of vital necessity to point out a few of the pitfalls and general disqualifications which many exhibitors, both experienced and inexperienced, often overlook when selecting and preparing their birds for exhibition.

One common, and, perhaps, the most common, error made by exhibitors, is the overlooking of a small piece of "down" or the stub of a feather growing out on the legs or between the toes.

Judges will disqualify any clean legged variety whenever any such feather or piece of "down" is found on the legs or toes of a bird. One cannot be too careful in examining between the toes for a small hair-like feather growing there. This is especially true in the case of Leghorns, Orpingtons, Wyandottes, Polish and Hamburgs, and, in fact, all varieties should be examined.

We have often, in judging fowls and visiting show rooms, seen cases where single entries or entire exhibition pens have been disqualified, due to one male or female in the pen having a slightly wry tail, crooked back, or one hip a little lower or a little higher than the other one. All of these defects and disqualifications should be carefully looked for in selecting birds for exhibition.

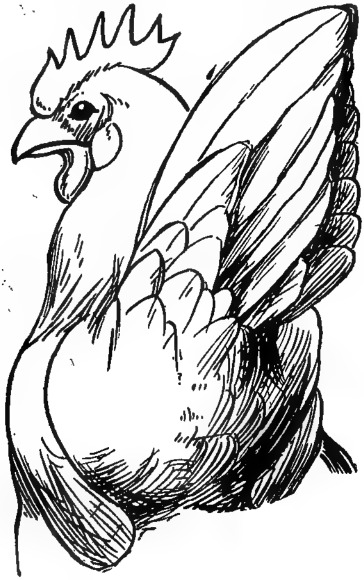


Fig. 2.

A fowl having a wry tail which disqualifies it from winning.

Again, we find that a very large per cent of the birds in the various show rooms are inclined to be knock-kneed and do not stand firmly and squarely upon their legs and lack the proper distance between their knees. This is not a disqualification, but it is a serious defect. It denotes a physical weakness, besides detracting greatly from the general typical carriage or symmetrical appearance of the fowl.

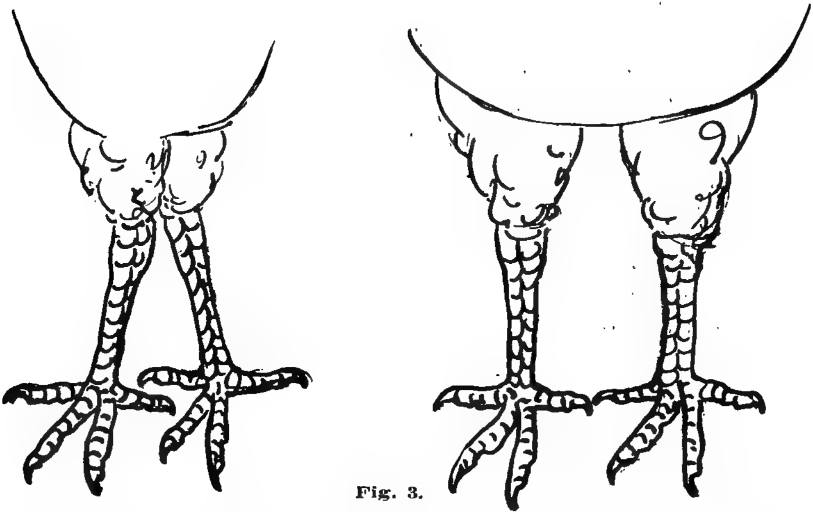


Fig. 3.

A knock-kneed, narrow breasted fowl; also a fowl standing squarely upon its Legs and having the proper distance between them.

The texture of the comb should be carefully examined before finally deciding upon the particular bird to make up a show string. The combs of some birds, especially on males, are inclined to be so fine, so thin in texture that the ordinary heat in a show room, or even the heat in the express car in which the birds are forced to travel, will cause slight comb enlargements. This is a serious defect. Combs which lop sufficiently will disqualify the specimen.

Other things being comparatively equal, for exhibition purposes one should always endeavor to select male birds with firm, stout combs, thus eliminating the chance of the combs "going bad," either en route or in the show room.

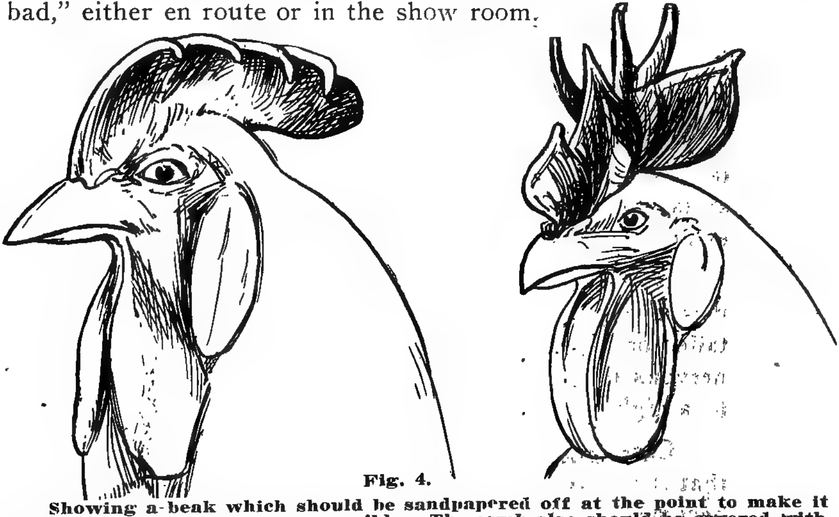


Fig. 4.

Showing a beak which should be sandpapered off at the point to make it fit the under beak as near as possible. The comb also should be covered with a handkerchief saturated with ether for about thirty minutes. By repeating this process three or four times in the course of a few hours it will sufficiently shrink the blood and heat from the comb and greatly assist it to straighten up.

Another very common defect, which we find upon many birds in the show, is one or more slightly crooked toes, as shown in Figure 5. This could frequently be overcome by the exhibitors, if the tendency towards this defect is noticed while the bird is very young and undeveloped. Very often a specimen with a crooked toe is exhibited, while birds which are otherwise practically its equal are left at home. While this defect is not a disqualification, it nearly always means the difference between winning and not winning, or, at least, the difference between a high or a low award, especially if competition is at all close and is made up of fowls of extra good quality.

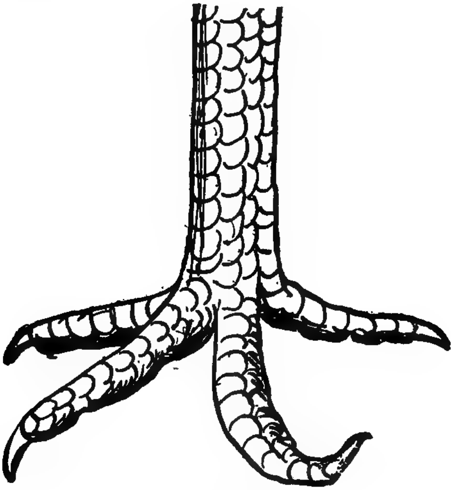


Fig. 5.

At the better shows, we seldom ever find a fowl with a squirrel tail, as illustrated in Figure 6, although this is not at all uncommon at fall fairs and local shows, which have numbered among their exhibitors breeders who are novices at the business.

In the case of Leghorns, Anconas, or other light-weight fowls, it is difficult to determine whether or not such males are squirrel-tailed or merely excited. When birds are more or less disturbed, nervous in disposition, etc., they are inclined to throw their tails to a higher angle than that which is natural for them.

Care should be taken to select a bird having a tail carried so that it will not be thrown out of the proper angle should the bird become disturbed or excited. Special care should be taken that no bird having a squirrel-tail is exhibited, as this is a disqualification.

A specimen that has what is known as a "slipped" or loose wing, should seldom, if ever, be selected for exhibition, as this is a serious breeding defect, which is looked upon by a judge with decided ill favor. Unless one finds it absolutely necessary to show such a specimen in order to complete an exhibition, it is better to leave it at home. Of course, if such a fowl is otherwise unusually good and this defect is not at all exaggerated, such a specimen can sometimes be shown with profit.

Wing weakness can be overcome, to a certain extent, if the fowl is taken in hand at an age when it is growing out its wing feathers.

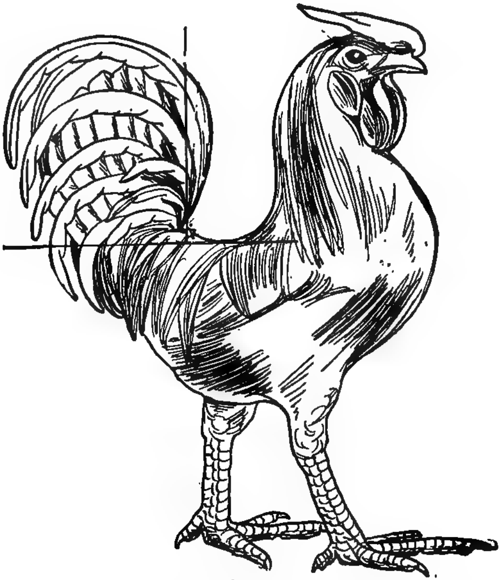


Fig. 6.

It seldom pays to put off the selection of your birds until just before the time to exhibit. On the contrary, for several days and weeks beforehand, the breeder should watch the gradual development and changes taking place from day to day, as the old stock develops a new cloak of plumage and the young birds near development. In his own mind, the breeder must picture the entry he desires to make and the number of birds of the different sexes and ages necessary to fill that entry. With that in mind, he must begin selecting and marking, by leg banding, the birds which appear the most promising for this purpose.

In selecting a bird for exhibition, one must consider: Firstly, the bird as a whole; secondly, section by section, giving due respect and consideration to the Standard of Perfection and its scale of values covering the shape and color of each section.

A breeder must, regardless of variety, pay considerable attention to head points, especially comb shape, eyes, ear-lobes, and color. These sections of a bird, if decidedly defective, will so appeal to the first glance of the judge and spectators that the bird can seldom hope to be placed among the leading winners, especially if the competition is made up of birds containing a normal amount of quality. The next important thing to consider is shape and general size. This is more important in the case of solid colored fowls such as Buff, White or Black varieties. The shape and size of a solid colored fowl is more often noticed by the judges than in the case of parti-colored varieties. Shape never escapes the judges' attention in any way, though there are varieties having a Standard color scheme requirement especially difficult to attain, wherein we occasionally find birds exceptionally good in color which are out in shape in one or more sections and are still considered extremely valuable by breeders and judges alike. This is more often found true in varieties like the Barred Plymouth Rock, Rhode Island Red, Silver Wyandotte, and other parti-colored varieties of this character. The bird with medium good color, typical shape, good size, splendid plumage condition and good head points, is usually a hard specimen to beat in competition.

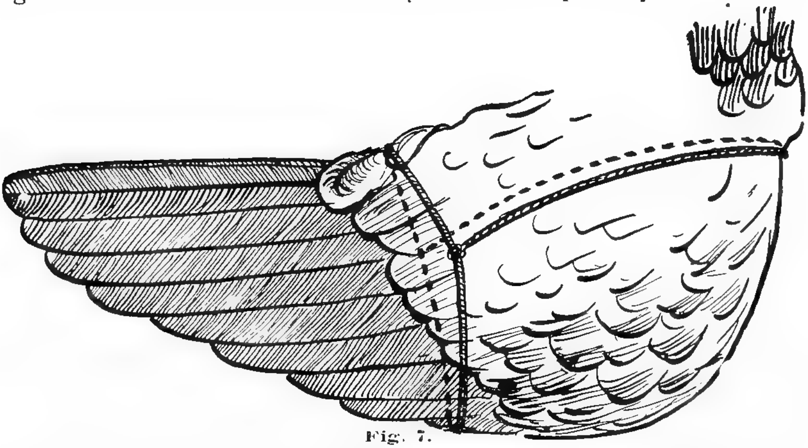


Fig. 7.

This illustration shows what is known as the wing "hobble," sometimes used to prevent birds from flying over fences and at other times used with success in strengthening a weakly carried wing. It is usually made of self-sticking tape, placing the gummed side of the tape outward, away from the feathers.

Extreme care must always be taken to examine every bird thoroughly for disqualifying points before it becomes a candidate for a place in one's string of exhibition birds.

General surface color is usually of more importance than undercolor, although in most varieties competition is usually so keen that the undercolor must ve very nearly equal to the surface color or the bird will stand very little chance of receiving an award.

Unless it is absolutely necessary, no bird should ever be placed in your show string which has a serious defect in any section, regardless of how good it might be in every other way. No birds are produced perfect. None are free from minor defects. It is preferable to exhibit a bird having several minor defects than a bird having a striking defect in some one section, which is so noticeable that it will be seen immediately by both judges and visitors. Large beefy combs, decidedly unsymmetrical birds, a decidedly brassy or creamy tint on the surface plumage of white birds, and tail carriage altogether too high are serious defects often found. Evenness of color and harmonious blending in all sections is a desirable asset in any exhibition fowl, regardless of breed or variety.

There are exceptions to all rules, but when possible birds should be selected, tentatively at least, two months before the exhibition date. On rare occasions, one can go out among his fowls and select birds a few days before the exhibit, but they will not be in as good condition as if they were selected far in advance and special work and care given them. In reality, the time to begin getting the bird ready for exhibition and the show room is when you mate the sire and dam. This simply means that the finest exhibition specimens are products of skill in breeding and rearing, and not merely in skill of conditioning or selecting birds. The latter two points are but the final "toilet" which helps the bird to look its best.

Our largest and most successful exhibitors and breeders watch their birds carefully from shell to show room. This means a steady growth without a set-back, and with every help towards perfection of form and color. Feed alone will not make show birds. Plumage must be protected from sunburn; combs must be developed evenly; ear-lobes and wattles must be kept from wrinkling and blistering. Imperfection of combs, lobes and wattles are more often the result of injury during the growing period than of heredity.

This should more clearly emphasize the importance of selecting the most likely looking exhibition specimens as far in advance of the show date as possible.

It must be assumed that the average breeder is already aware of the qualities of his old fowls, therefore. we can think of no excuse for not selecting the most likely exhibition birds from among the older ones, at least 60 to 90 days in advance, for any exhibition he is contemplating making.

It is important to allow all the time possible so that one can examine the birds as to their condition of plumage and, if necessary, assist them through the moult or in developing plumage on any section. It is highly important that old birds, especially cocks, are as nearly finished in hackle, saddle and tail covert plumage as possible. This adds greatly to the general appearance of a cock bird. Male birds, especially cocks, should be fat at the time of exhibition. This helps their general shape, general appearance and means they are much more likely to carry away the coveted prize.

There is much work to be done in properly preparing birds for exhibition, especially old birds, such as looking after the general color, the condition of the scales on their legs, and the condition of the plumage, and often much work is required to overcome any bad habits of comb twisting, etc. This all requires time.

In other chapters we have given the details regarding these necessary and important items or work. Show room success should be the ambition of every fancier, and no part of his work is more important than training himself to be well skilled in the fitting of his birds that they may receive at first glance the favorable consideration of the judge.

The inexperienced exhibitor often overfits his birds. Please do not understand, because we urge that birds should be selected well in advance of exhibition, that they must have too much work done on them. When a bird has been cooped and worked with and pampered until it has "gone by" it makes quite as poor an impression in the show room as though it had been incompletely conditioned.

Young birds quite often do better if permitted to run at range until two or three weeks before show time. However, they should be well separated and only a few birds allowed to house or roost together. The male birds, especially the heavier ones, should be brought up two or three weeks before show time and placed in small houses by themselves, where they should receive more or less hand feeding, being given all they will consume of feed which will grow plumage and flesh.

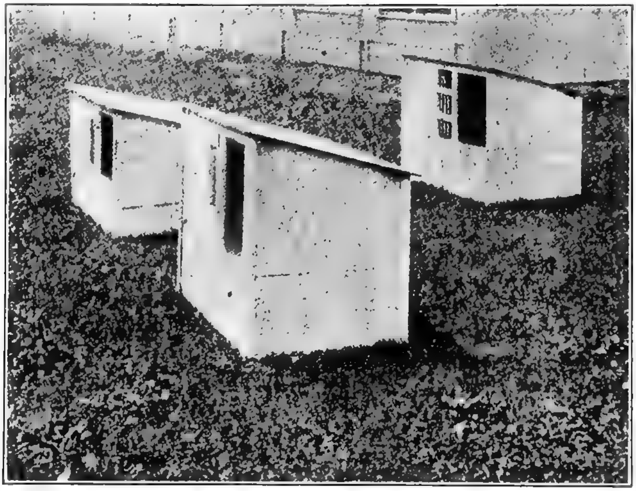


Fig. 8.

Cock Moulting and Conditioning Coop to be used out of doors, and can be placed as close together as desirable so as to lessen time and labor. In the case of white birds or birds which are easily affected by rain or sunshine, it is desirable to place male birds, early hatched cockerels and old cock birds in these houses during the summer and fall. Not more than one bird, however, should be placed in a coop. In the event that birds are being trained over a considerable period of time in training exhibition coops it is well to place them out in one of these coops during a few hours of the day, at least every third or fourth day, so as to give them additional exercise. In breeds requiring male birds to have heavy breasts and bodies and that should not appear too lankey or long legged, it is often advisable to pick out the most promising cockerels when they are about four-fifths developed and confine them to one of these small houses for a period of from three to six weeks. Let them out semi-occasionally for a little additional exercise and natural grubs and worms. By so doing it is surprising how they will fill out and settle down on their legs. These coops are usually built about three feet wide and four to five feet long, not over three feet eight inches high in front and two feet ten inches high in the rear. See Fig. 8.

The most important fact of all in the final selection of a bird for exhibition should be its physical condition. To this the bird owes its value and attractiveness which, first of all, is noticed and admired by judges and visitors.

A bird should carry all its main wing and main tail feathers and none of these should be broken. The cuts which the judges are instructed, by the Standard of Perfection, to make for these missing or broken feathers are so great that, in close competition, a bird so handicapped can seldom win a blue or red ribbon.

A very important matter for consideration in the final selection of birds for the show is the matter of weight, and especially is this true in score card shows. Everyone should inform himself as to the exact Standard weights which his particular variety should weigh in the show room in order for his fowls to pass without a cut.

In selecting probable exhibition birds, it is vitally important to bear in mind those that have the proper style, the proper form and frame on which to place the proper amount of flesh to make the bird appear at its best, and to insure that it will measure up to Standard requirements for weight.

Our English cousins show their birds in splendid condition. They are likewise noted for always having birds of good size; birds that are heavy boned. They breed for heavy bone; they feed for it; they get it. Both are an index to strength and health.

The condition of a chicken in its highest exhibition state is a curious thing. It is a mixture of natural and hand polish. The breeder must have a good quality fowl or foundation to begin with, or the best fitter can never finish the bird to the best advantage.

MOULTING

Chapter 7

Feeding During the Moulting Period

The cow, horse and other animals, which carry a coat of hair, shed their hair in the spring and put on a new and thinner coat for the summer. Hens moult in the late summer or fall and put on a new winter coat at that time. The old feathers die during the summer and many of them fall out from time to time. At moulting time, all of the old feathers die and are cast off, and an entire new coat is grown.

Inasmuch as there is one-fifth as much nitrogen in the feathers as there is in the entire body of a fowl, it is obvious that the manufacture of an entire new cloak of plumage in such a short length of time is an enormous strain on a fowl's system. A fowl's feathers represent about five per cent of the total weight, and there are about 8,000 feathers on every bird. Some hens moult twice in a single year. It usually takes hens from two to three months to entirely complete the moult. Older birds moult more slowly and do not shed feathers as rapidly as younger ones. Hens usually stop the production of eggs either during or just preceding their moulting period.

When a hen stops laying in the summer or early fall, she usually starts moulting. The later a hen lays into the summer or the longer she lays, the greater will be her production of eggs for the year. The high producer is the late layer, hence, the late moulter. If nature is allowed to take its course, it usually requires about six weeks for a hen to completely renew the main primary wing feathers.

We can influence, to a great extent, the moulting period in different ways. If it is desirable to have certain individuals among the females moult early, care should be taken to separate them from the other hens and their feeding rations should be changed. The object, in this event, is to have them cease laying and get a little thin in flesh. Egg-making feed should then be supplied them. This will bring on an early moult.

Hens which are to be exhibited at a later date should be handled differently. Care should be taken not to change their living conditions, to overcome any tendency towards their becoming too fat, and not to make any decided change in the application of their feed or the formula of same. In other words, keep them under a laying strain and producing eggs up to about eight weeks prior to the exhibition where it is intended they shall be sent.

When hens stop their production of eggs, is the time they are most likely to go into the moult. This being the case, cultivate the late layers and handle your fowls so as to prevent summer moulting, as hot weather moulting seldom produces the texture or quality of feather, or the color desired.

A steady drain on the system exists at moulting time, and the fowls must have feed rich in protein, fat, and feather building materials. This feed must be rich in nitrogen. It is best to add a little more meat feed and some Old Process Oil Meal at this time. Sunflower seed is also excellent.

We increase the amount of the whole corn or corn chop during the moulting period. Corn chop is better if of good quality, as the work of digestion is then partly accomplished. We use the same mash as we ordinarily use, but add to every one hundred pounds of the mash ten pounds of O. P. linseed meal and fifteen pounds of beef scraps. We do not add this all at once. Thirty-three and one-third per cent of the increase of both linseed meal and beef scraps is added each week, for a period of three weeks. Even then, we watch their bowel action closely, and if there is any indication of diarrhea we reduce the amount of these two ingredients slightly and add from two to four pounds of powdered charcoal to each one hundred pounds of the mash.

We do not believe in the extreme method of starving the hen for a period of from three to five weeks before the moult in order to get her exceptionally thin in flesh and to loosen her feathers, as this, all too often, so weakens her constitution as to make it impossible for her to produce feathers of the proper texture and character.

In the case of highly colored birds, such as Rhode Island Reds, Barred Plymouth Rocks, Golden Wyandottes, etc., we find when starved too severely prior to the moult, the hens seem to be lacking in certain mineral elements necessary to reproduce the desired quality of color in their next cloak of plumage.

When starving a hen completely down in flesh, which can be done by placing her on a ration of green feed and water from three to five weeks, we find that the hen draws upon her own body for certain minerals necessary to her health and strength. The old expression "they die hard" fits the case here. Before a hen will give up her flesh and desire for more of these elements, she will draw upon the mineral contents of her own body until finally she is so weak and thin as to be unable to stand.

We have found it desirable, when the date has been selected for moulting certain males or females, to take all heating feed from their ration, such as corn meal, gluten meal, dairy chops, cracked corn, etc. In fact, we feed them on a mixture of succulent green feed twice a day and, if possible, we grind this up in a meat grinder and add a mixture of equal parts of wheat bran, wheat shorts and ground oats, and to this is added five per cent of O. P. Oil Meal by weight.

A sufficient amount of this ground grain mixture is added to the ground succulent green feed to absorb the moisture from same. It is desirable that this mixture be fed to the chickens in a crumbly state, and it should be given to them two or three times a day. It must be remembered that ground or chopped succulent green feed rapidly becomes stale and loses much of its mineral contents and value. Only enough for one feeding should be ground at a time. It will be seen that the preponderance of this moistened mash is made up of the succulent green feed, thus supplying the hens with certain elements necessary to keep them in a good physical condition and yet, at the same time, have the effect of reducing them in flesh. We would not follow this practice to exceed ten days or two weeks. During this time, however, it is desirable to handle the individuals, and if it is found there are any short stubs of feathers in the center of the back or over thighs of any hens, caused by the males treading them during breeding season and breaking off the plumage, we would advise plucking these stubs. Often it is found necessary to use a pair of tweezers in order to get out the short stubs of feathers. In the case of the main wing and main tail feathers of males or females that have been given "starvation treatment," so to speak, for ten days, we occasionally feel of the main wing and tail feathers to determine whether or not they are becoming loose. If loose, it is often desirable to pluck them. Main wing feathers should not all be

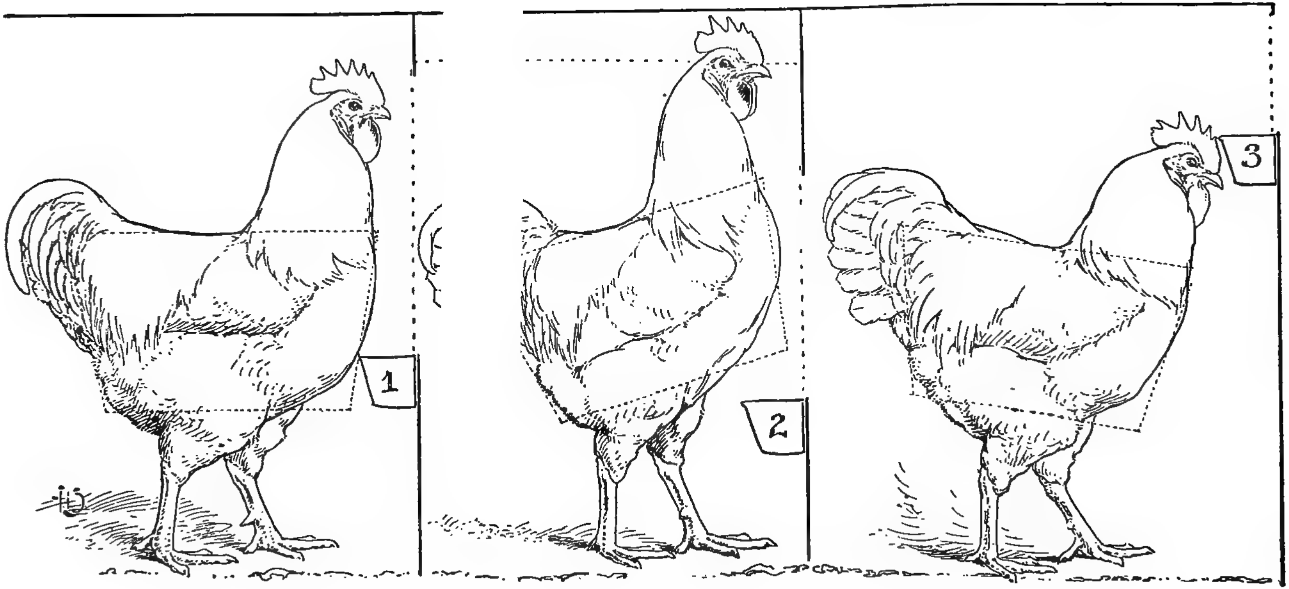


Fig. 24.

This illustration was drawn by Artist F. L. Sewell of the Reliable Poultry Journal of Quincy, Illinois. These three outlines illustrate habits of carriage in breeds that fanciers desire to have carry their bodies almost horizontally or on the "level."

Fig. 1 shows a coop with an opening in front, represented by the dotted lines, the opening being so placed that it encourages ideal carriage. No. 2 shows where the opening should be placed for a fowl that is inclined to carry the front part of its body high. Make the opening for the feeding and watering cup low down and thus encourage the bird to lower the front part of its body, and to form the habit of carrying it in that manner. No. 3 shows a coop arranged with feed and water cups and the opening for view high up in front in order to induce the habit of the higher carriage of head and breast of an individual fowl that habitually carries himself too low in front. Artist Sewell has perhaps visited the yards of as many noted breeders and has been in the aisles a careful handler and observer of as many of the best birds of the world as any other single individual, therefore, his suggestions along the above line are of added value.

plucked at one time, but, starting with the main primary wing feathers, we pluck one or two of them every other day, care always being taken to hold the shoulder of the wing firmly and to pull the main wing feathers straight out, so as not to injure the cell from which the feather grows. The same care should be exercised in pulling main tail feathers.

In the case of male birds, it is often desirable to pluck a few of the hackle or neck feathers at a point well down on the neck or at the junction of the neck and shoulders. As a rule, these are the last neck feathers moulted.

If a bird shows signs of moulting early he can be hurried in the process by pucking the old feathers, a few each day, but this also requires some experience, for unless one is careful he is liable to do more harm than good. A safe plan is to dip one hand in water, shaking off the surplus, then rubbing the dampened hand over the feathers rather vigorously, always in the same direction as the feathers lay. Many feathers will stick to the damp palm. These are ripe ones that were about ready to fall out, but which thus come out a week or ten days before they naturally would. This should be repeated every few days and will do the bird no harm, and hurries up the moult considerably.

It is not advisable to change suddenly from the starvation method of feeding to full force feeding. It is better to increase the feed gradually, keeping a dry mash before them only two or three hours per day from seven to ten days. After that the dry mash hoppers should be open all day. Af first, give only one moistened mash per day, just what they will consume in ten or fifteen minutes, gradually increasing the amount until you are giving two moistened mashes per day, all they will consume in thirty or thirty-five minutes. The mashes should be moistened with sour milk, butter milk, whole or skimmed milk. If this is not available, procure a few fresh green bones. Boil them from six to seven hours; season with salt; dilute with four parts hot water, and use this liquid to moisten mashes. Left over bone soup can be placed in an air-tight jar and kept in a cool place two or three days, but must be heated again when used.

The same practice should be followed in feeding scratch grain. At the start put the fowls on a ration of one pint to each twenty-five fowls. This must be scattered at the break of day, or after dark in the evening, into dry, crisp litter. One and one-half pints of scratch grain should be given to the same number of fowls one hour before roosting time. We prefer oat straw for litter. It has a brighter color and is free from beards so common in wheat straw, which often injures the eye-sight. Increase this amount gradually, until within a week or ten days you are feeding a pint to each ten females in the morning, and a pint and one-half in the evening one hour before roosting time. As you increase the amount of moistened mash and scratch grain, observe carefully the appetites of the fowls. Do not increase the volume of feed more rapidly than they consume it and thoroughly clean it up.

The drinking vessels must be kept perfectly clean and amply filled. In addition to fresh water, milk in some form is advisable as a drink, if it can be obtained, but do not use sour or butter milk one day and sweet the next. Use one or the other continuously, or do without. It is very necessary that an ample supply of some kind of good hard, medium size grit be available and handy for the hens to consume at will. Oyster or lime shells will not take the place of hard granite or mica grit for the purpose of grinding up the feed thoroughly and rapidly as it passes through the gizzard.

Providing these grains are available, and providing you mix your own scratch grain, we would recommend the following as a very good scratch grain ration:

75 lbs. of sifted cracked corn.
25 lbs. of whole wheat.
5 lbs. of sunflower seed.

The following mash mixture fed in connection with the above scratch grain is desirable, although somewhat complicated, and in some territories our students would be unable to procure all of these ingredients. In which event, a different mash formula must be provided, but for the best results we recommend:

200 lbs. wheat bran.
200 lbs. wheat middlings.
200 lbs. corn meal dairy chops.
200 lbs. rolled or ground oats.
150 lbs. dry beef scraps.
75 lbs. alfalfa meal.
50 lbs. gluten meal.
25 lbs. of Old Process Oil Meal.
8 lbs. fine table salt, no lumps.
25 lbs. fine granulated charcoal

You can easily reduce or eliminate the seventy-five pounds of alfalfa meal, providing you are furnishing the fowls with an ample supply of succulent green feed at least once each day. Not more than one inch square of succulent green feed per day should be given them during this period of feeding. About twice each week we would suggest that you adopt measures which will whet their appetite and increase their consumption of moistened mash. The best way to do this is to procure a few fresh green bones from your market and boil them thoroughly four or five hours, seasoning with salt to taste, about the same as if you were preparing a soup for your own table use. Dilute this with four parts of hot water and use this mixture for moistening a mash feed. Do this, even though you are providing milk to drink, as in this instance the mash moistened with bone soup is intended to develop appetite. It is not advisable to procure such a large quantity of green bones that you will have any great supply of the bone soup left over. A fresh supply each feeding day is more desirable.

If you live on a sea shore or in a locality where it is difficult to obtain beef scraps, use fish meal, but under no circumstances substitute cotton seed meal for the Old Process Oil Meal. This is sometimes done in Southern states where cotton seed meal is more readily available, but the results are not as satisfactory.

During the moulting period of an adult fowl, two or three things must be guarded against; the houses must be perfectly clean; the birds desirable for exhibition purposes must be selected and put into quarters by themselves where they will have a sufficient amount of room and fresh air; their bodies must be absolutely free from lice. It will pay to dust every section on each fowl, including main wing and main tail feathers, with sodium flouride powder, or annoint the fowls with a good body lice ointment.

Poultrymen must guard moulting hens and cock birds from dampness and draft. It is during the moulting period that they are in the most weakened condition, and they will contract colds and diseases readily.

If you are moulting hens or cock birds for an exceptionally early show or fall fair, it often pays to carry any such birds far away from their houses and quarters and teach them to roost in trees during the moulting period. At this season the weather is usually dry and hot. To moult and reproduce feathers of the proper color, they must have fresh air, and air that is as cool as possible. This method is especially helpful in the case of Rhode Island Red hens and other highly colored birds.

The main reason that hens fail to moult in hot weather arises from the fact that they have too much fat on their bodies. This is reasonable, because they do not need to utilize any feed stuff consumed for keeping their bodies warm. As fall and cooler weather approach, if we continue feeding and caring for the hens in the usual manner and continue to supply the same feed mixtures, the fowls will utilize a greater portion of their feed in supplying meat for the maintenance of their bodies. This causes the hens to become thin in flesh, resulting in the old feathers gradually drying out and dropping off and new ones taking their place.

A hen can stand the production of excessive fat and be able to produce more eggs with less strain than she experiences in producing feathers. There is a good reason for this. Feathers require more protein than do eggs. This is also the main reason why it is so hard to produce eggs and feathers at the same time.

Should your hens be in a laying condition while growing new feathers, the latter will be lacking in quality. The feather itself will be narrow and slim. In highly colored birds, it is difficult to grow the proper shades of color if the hen is in a laying condition when the feathers are produced. It should be observed that the moulting season is marked by a lack of appetite. Ordinarily this should not be discouraged by the feeder, as the hen is far from a perpetual machine when it comes to egg production, but in the case of moulting a hen for exhibition purposes, the loss of appetite, once they actually start moulting, should be discouraged as far as possible. Once the feathers are loosened from the bird's body and a certain portion of them begin to fall out, and new feathers start growing in their place, the appetite of both males and females will return.

Another very good and quite simple mash formula to feed for a period of three to four weeks following the starvation period is as follows:

64 lbs. of corn meal.
15 lbs. middlings or wheat shorts.
21 lbs. beef meal.
3 lbs. oil meal.
9 lbs. gluten, and
½ lb. fine table salt.

The proportions in which to feed this are five parts of scratch grain to twelve parts of ground feed by weight, feeding the scratch grain in the litter and the mash feed in dry mash hoppers and in moistened form. This formula may be considered the connecting link between the starving ration and the one which would be used to add additional flesh. At the same time, this formula is excellent for feather building material, and should only be applied for a period of about three to four weeks, after which we prefer reverting back to the previous formula for dry mash.

FEEDING

Chapter 8

Feeding to Increase Weight and Obtain Lustre of Plumage

In feeding fowls or young stock intended for exhibition purposes, it is of the utmost importance to bring them to the show room in the "pink" of condition. Skillful feeding is one of the prime essentials towards this end. One of the secrets of carrying off the coveted prizes lies in having the birds up to weight. In order to get them up to weight, especially for the earlier shows, it often requires extra feeding. To keep the appetites of the birds "keen" while feeding them heavily is, indeed, a problem. A variety of feed, together with enough exercise to keep them in a healthy condition, is necessary. Birds of low weight can be brought up rapidly by feeding a mash composed of ground wheat, ground corn, and ground oats mixed with a supply of fresh meat scraps or other protein feed. This combined mixture must be thoroughly ground.

It is always advisable to mix a moistened mash and supply two feedings a day, moistening same with milk, either sweet or sour. This renders the mixture more palatable and at the same time adds to its food value. A great deal of the high lustre of plumage can be traced directly to milk feeding and an abundance of meat scraps, with about five pounds of O. P. Oil Meal added to each 100 pounds of the dry mash. In the case of supplying meat scraps, watch carefully that diarrhea does not result. In case this should result, reduce the meat scraps and add two to four per cent of powdered charcoal.

In the case of young birds, it would be advisable to add five per cent of bone meal to the above ingredients. For a definite mash mixture, to increase the weight of both young birds and old birds, I would recommend the following:

50 lbs.	whole ground wheat.
100 lbs.	corn meal or dairy chops.
50 lbs.	ground oats.
40 lbs.	commercial beef scraps.
12 lbs.	bone meal.
2 lbs.	fine table salt.
6 lbs.	powdered charcoal.

Needless to say, good hard grit, as well as oyster shell, should be kept available and handy for them at all times.

Trap-nest records show that, under ordinary circumstances and feeding, hens require from 70 to 90 days in which to complete the moult. During the first third of this period, when merely shedding old feathers, I find that hens which are bred and physically built to lay will continue producing eggs, stopping only when their feed is required to supply materials out of which to fashion the growing feathers.

The average fowl, male or female, if properly cared for and fed, should not require a longer period than from forty-five to sixty days in which to complete the moult. The older and weaker the fowl in vitality, the longer will be the period required to complete the moult. Generally speaking, the fowl that drops a few feathers at a time and replaces them one by one, is not as good a fowl from a physical standpoint; neither is she likely to be as good a layer as the fowl whose feathers all seem to drop out at once, leaving her bare for a time. Growing the feathers in the latter way is an immense drain on any fowl's vitality. It has also been found that hens whose feathers all drop out at once are more likely to produce a new cloak of plumage, which is likely to be more level in color than is probable in cases where fowls moult gradually.

FEEDING TO EFFECT COLOR OF PLUMAGE

Many prominent breeders and authorities differ in their opinions as to the effects of different grains on the color of plumage, and especially is this difference of opinion noticeable in regard to creaminess in varieties having white plumage.

It has been our experience that any system of feeding or any particular grain which has the effect of placing an unusual amount of fat on the bird in a short space of time will produce a "fatty" oil, which makes the new-grown feather have a creamy appearance. This stays with the bird, unless we so feed as to cause the bird to go through a hardening or drying out process, during which period this creamy plumage will become white.

It has been found by previous and long experience with white birds that they must not be permitted an abundance of green feed, such as clover, alfalfa, blue grass and the like. The whitest birds are those kept entirely off of range, more or less on barren ground or in their houses, during the period in which they are growing their final coat of new feathers as youngsters, or during the moulting period if they are adult fowls.

Scientists, however, have been able to show, beyond the question of a doubt, that to some extent yellow corn will more readily cause white plumage to become creamy; and, vice versa, it will have the effect of leveling up the color of Buff or Red birds to a greater extent than will white corn, wheat, oats, or buckwheat.

Whole wheat and whole buckwheat are two excellent feeds for fowls having white plumage. Whole or ground buckwheat is exceedingly whitening in its nature and is used in England to whiten the skin and flesh of milk-fed chickens. There is no feed or mixture of feed that will give a whiter plumage than mashes made of ground buckwheat, ground oats, and a low grade of flour, mixed properly with thick, sour, skimmed milk or buttermilk. This feed is known not only to whiten the flesh of birds, but to whiten the plumage as well.

Exhibition fowls should receive daily one or more feeds of whole grain, as too great an amount of mash feed is quite apt to lessen their vigor and effect their activity. It is always desirable to prevent fowls from becoming sluggish. Their appearance in a show hall is fifty per cent improved when they appear full of life and very active, though thoroughly tame and well trained.

Those who doubt that a fowl with a Buff or Red plumage can be color fed should go into the question fully with a proficient canary breeder, one who feeds his little birds for color. Tasteless pepper given in capsule or pill form morning and evening, immediately after meals, is commonly used to level up the color of Buff fowls; although, as in meat feeding, one must watch development carefully, so as not to get the coloring too deep. It is best to put the tasteless pepper up in small two-grain capsules and adjust the number of capsules given the fowl by the appearance of the color of the new grown feathers. Glance at a number of color-fed canaries, in which a number of novices are exhibiting, and you will see various shades of color. One exhibitor overdoes it, while another falls short.

Our exerience has been that yellow maize or corn not only affects, to some extent, the color of the plumage, but it will positively tint white ear-lobes. Hemp seed will strengthen the ground color in plumage of highly colored fowls, such as Dark Brahmas, Silver Wyandottes, and Rhode Island Reds.

The color of the plumage can be made or marred during the moult. It is a very intricate question, and one which it will pay you well to study sincerely and to experiment on some fowls of lesser value, always watching results carefully. The best of health, the best of sanitary water, the best of fresh air, milk, feed and care is absolutely essential if we expect to obtain on adult fowls a new coat of plumage having a color anywhere near that to be found on the same fowl as a cockerel or pullet. The same can be said in developing youngsters. Chicks can be ever so well bred, but without proper care and feed they will be deficient in both color and shape when fully matured.

To obtain an even, desirable color in the new cloak of plumage, a quick moult is essential. Equal shading and treatment must be provided to avoid "patchy" colored feathers. It is well to keep white birds in a medium dark room, where bright light and especially sunshine, does not touch them. The same might be said of dark colored birds. It is not difficult in the moulting of old fowls to know just when to practice color feeding, for it is during that period when feathers are starting to grow that color feeding must be practiced. In the case of young birds, however, it requires careful sorting up and culling according to their development. Birds of the same age will not always start producing their final cloak of adult plumage at the same time. This necesssitates more or less handling and observation.

It has been found that in feeding either young or old stock of varieties other than white fowls, the milk solution used for moistening the mash should consist of five per cent of pure melted lard. This will greatly aid in feather coloring, as it will materially assist the condition of the fowl and the production of the feathers.

For the same reasons that green feed and the like be kept away from white plumaged fowls, green feed, yellow and red corn should be supplied to dark plumaged birds. In the case of black, red, and dark colored or parti-colored varieties, the fowls should be supplied with a small amount of saturated carbonate of iron, about one tablespoonful to each quart of drinking water. This will decidedly help to deepen or level up the body color of the feathers.

Care should be taken in the case of moulting fowls, or youngsters growing new feathers, not to touch or handle them any more than is absolutely necessary. This should be done only at night, if possible. If in handling the bird any of the new feathers are bruised, causing blood to flow, the coloring will be affected. This is most noticeable in black and red fowls. Especially are the tips and other portions of the main wing feathers easily affected by slight bruises.

Many do not know that during the moulting period fowls always shed the scales from their legs and toes. It is often advisable to give them a little help in moulting these scales. Wrapping the legs with half-inch strips of muslin, after first rubbing vaseline well into the legs, is an aid toward better yellow leg color and helps toward moulting the scales and growing well formed new ones.

Some of the leading breeders of America and most all keen fanciers make full use of what is known as "cockerel" boxes or very small colony coops, as shown in Figure 8, for moulters and nearly matured youngsters.

This is a practice that pays a good dividend. Many breeders take great pains in breeding, rearing and washing their fowls for exhibition, but it is surprising how neglected they are when it comes to proper care of the legs, toes, and of the individual bird during the final feather growing period. Cock birds and cockerels should always be placed in these small houses or coops entirely by themselves, with the possible exception of the occasional companionship of one or more old hens of other than exhibition qualities. Females, both pullets and hens, can be placed in these small colony coops. Two to six in number do very well together. Greater improvement of form and plumage condition will always be obtained when fowls can be housed singly or in small groups.

The color of the legs must be observed just as much as the color of plumage. Birds that are out on grass range usually have well colored legs, while birds kept in barren pens for any considerable length of time have leg color which appears faded out. This can be overcome, in most cases, by oiling and wrapping as we have already described, or by wiping daily with a wet cloth while moulting or in training for exhibition.

In the color feeding of black birds, it is interesting to review the experience of one of our oldest fanciers, a man who, in his time, was known as a very, very successful breeder of Black Minorcas. In reviewing some of his experiences and observations as to the effect of feeding for black color, he has this to say: "Several years ago, I had a late hatched Single Comb Black Minorca Cockerel that had the promise of making an extra fine bird. He was too late and immature for use that season. I put him out on a farm to hold over for a cock bird. The following fall, during his moult, this bird was fed wholly on yellow corn, and when I came to look him over after moulting, I found much to my surprise, that he was off in color, showing purple barring to quite an extent. Otherwise, he was a grand bird. I decided to hold him over another year. Late in the following summer, before he started his moult, I brought him in and placed him by himself in a roomy coop with a good grass run attached. All through his moult I fed him mostly wheat, with now and then a feeding of buckwheat or oats. The result was that his color had an almost perfect, rich, greenish sheen, free from any barring or purple. He won the blue that season at one of our leading shows in fast company."

It is now generally conceded that yellow corn, or any excessive heating feed, will supply coloring matter that will improve the color in plumage where it does not already contain, in its natural state, all the coloring matter that it will stand. In the latter case, it supplies an excess of color which will produce purple or brown barring on all black birds, and also shows the same effect on Barred Plymouth Rocks. It is a recognized fact that purple and brown barring in black birds, on Cornish fowls and the like, is the result of an excess of color and can, at least, be partially overcome by reducing the volume of heating and fattening feed.

TRAINING AND FITTING FOWLS FOR EXHIBITION

Chapter 9

Fitting fowls for the show room is one of those jobs in which brains and experience count for much. It requires a master of details. No fitter can afford to overlook a single point; least of all can he afford to exhibit his string insufficiently prepared when he knows that some of his competitors, if not all, will present their fowls in their complete show attire which has won victory for them against great odds on many a hard fought field, as it were.

Fitting a fowl or animal for hot competition is an art which must be learned from the ground up. It takes a hard lesson in the school of experience to smooth this path to fame. Much time will be saved in learning the first principles, or the underlying knowledge of how to go about this work.

To those breeding Standard-bred poultry, fitting and conditioning fowls for exhibition is a promising and profitable field. English and Scotch show men seem to possess the particular faculty for securing and holding conditions. It matters not whether it be in horses, cattle, sheep or fowls, the thorough Britisher and the canny Scotch seem to know the why, the how and the wherefore of this art. Candidly, I believe the whole secret lies in their constantly working with and everlastingly thinking of the fowls in their pens. If their fowls lack reach, their feed is placed in a tin cup fastened high on the wall so as to make them stretch. If the much feathered Cochin fails to grow an abundance of soft, long plumage, sugary water is mixed in with the soft feed, and if the Bantam chicks grow too fast, rice forms a large portion of their grain diet.

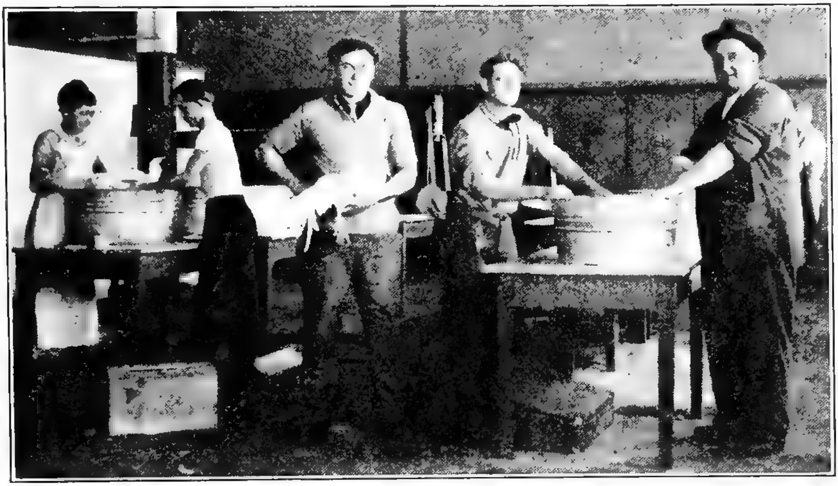


Fig. 9.

Poultry exhibitors at the Panama-Pacific World's Exposition held in San Francisco in 1915, washing their fowls in a specially constructed washing) room in the very center of "The World's Fair" grounds. A member of the faculty of this School will be seen at the tub with Mrs. Harnley of Illinois washing a White Orpington which two days later headed first prize pen.

Condition in its highest state is a curious thing. It is a mixture of natural and hand polish. Of course, the fitter must have a good quality of fowl to begin with or the finish can never be put on. It is the grain of the birch that takes the beautiful polish we all prize so highly and for which we pay so much money, but it is quite a trick to put it in the shape in which we like it. There are lots of gnarly limbs on birch trees that never will take the right sort of polish, just as there are lots of fowls and animals that never attain the right condition, try as the fitter may. If we could always depend on obtaining for the single or pen classes, or both, fowls that are exactly the same in ancestry, vitality, age and disposition and whose confirmation and covering are identical, then this matter of fitting would be one of "rule of thumb." But as there are no two cockerels, pullets, cocks or hens precisely alike, even in minor characteristics, each must be handled as a separate unit, and in a separate fashion. Always, there is something heretofore unknown to be considered; some new problem to be solved, and each must be handled by itself. There are some which for want of a better name, we shall call "natural born growers and fitters."

It is a well known fact that Mr. Arthur Duston, a prominent White Wyandotte breeder in the East, very frequently spends his spare time fitting birds owned by other breeders and intended for Eastern shows. We will always have poultry shows. There will always be breeders and growers who will be willing to pay liberally for the services of an expert, and most expert conditioners are what we would call "natural born growers and fitters." There are always a limited few who excel others in some degree in anything to which they turn their hands. The bulk of us should not become discouraged because it has become the fashion to say this, and we should remember the truthful saying of the Irishman, "To succeed, it requires one per cent inspiration and ninety-nine per cent perspiration." The way to reach the top is to keep trying. Never give up. "If at first you don't succeed, try, try again."

A good fitter never overlooks what is underneath. An exhibition bird whose legs and feet are not properly prepared always reminds me of a man in a full dress suit and rubber boots. The best strings of birds shown at the prominent shows which I attended last winter showed numerous specimens standing on well-fitted legs.

If I were asked to pick out the best all around conditioned strings in any show room I believe the selection might almost be made by walking along the aisles noticing only what was below the hocks.

The time to begin working on the legs and feet of the show bird is months before the show. When the time comes for the final touches, we have found a hammock especially handy as a means for holding the fowl. This method is illustrated in Figure 25. Compared with the old fashioned method of holding the bird on the knee or under the arms, it is a much easier and more practical way for the fitter, allowing as it does the free use of both hands.

If we find any cocks or hens that have not entirely removed the old scales and the scales appear loose, then the thumb nail is pressed firmly against the side of a scale and same removed. This should be continued on down over the legs and toes, care always

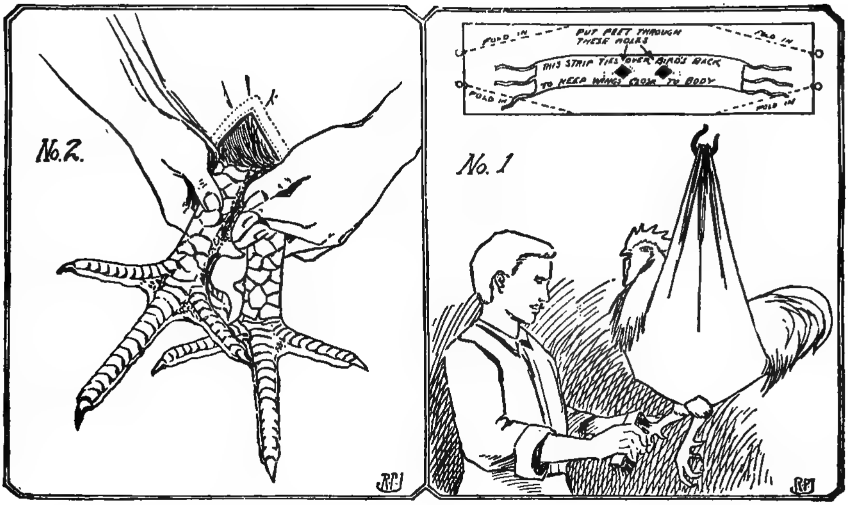

No. 2
No. 1
FOLD IN
PUT FEET THROUGH THESE HOLES
FOLD IN
THIS STRIP TIES OVER BIRD'S BACK
TO KEEP WINGS CLOSE TO BODY
FOLD IN
FOLD IN

Fig. 25.

Fig. 25 shows a hammock to hold a bird while it is being prepared for exhibition, especially while its legs, feet and toes are being worked upon. Number one of the above group shows an easy and convenient way to hold a bird while washing on its feet, legs, head or tail. In the upper part of this picture is a detailed drawing showing how this hammock is made. By slipping the feet and legs of the bird between the two square holes toward which the arrows are pointing, then bringing the ends of the hammock outside of the wing shoulders and tying them firmly and securely over the back of the fowl, it holds it firm and prevents it from flopping. The second sack or basket is then made in such a manner that it has ends long enough to fasten to a hook from which the bird hangs. The hammock should be made of heavy muslin. Its size varies according to the weight and bulk of the bird used to fit it. Rings are fastened to it, as shown in the upper drawing in Number 1. After the bird has been placed in the hammock the operation reminds one of putting overalls on a rooster. The rings are gathered together and strung on a hook attached to a rope hung from the ceiling of a conditioning house. Number two in the above group shows the method of removing or moulting old scales with the thumb nails, and thoroughly washing the feet and toes with a scrub brush.

being taken not to remove or injure the under scale. If you remove the new under scale, bleeding will follow, and the leg will be blacked by an unsightly dark or bruised scale. If it is impossible to remove the outer scale, as is sometimes the case, polishing with powdered pumice stone will make a rough leg thoroughly smooth and presentable. A "creamy" paste made by mixing sweet oil and powdered pumice can be rubbed on the scales after the manner in which a boot black polishes shoes. This method is shown in the figure. If a strip of cloth, which is used in polishing rough scales that could not be removed, is dampened with sweet oil before being used, it will be found to retain the paste much better.

As we mentioned in the previous chapter, moisture is quite indispensible in maintaining the color of the legs. A very unique method of preserving leg color is practiced by some breeders. They place a good sized granite dish filled with rain water to the depth of about three inches on the outside, next to the door, of each breeding pen. This pan is so placed that every time a fowl leaves the house it is compelled to step into the water. In this way, the feet and legs are moistened several times a day.

If one is so unfortunate as to find it necessary to fit a bird for exhibition which has been neglected and allowed to become scaly legged, Oil of Caraway will be found one of the best cures. An ointment can be made by mixing one part of Oil of Caraway and five parts of White Vaseline. This should be rubbed into the affected parts after they have been thoroughly washed and dried. This should be done until the disease disappears. Oil of Caraway causes very little irritation and is very penetrating. When a fowl has scaly legs, the scales on the feet and legs are raised by a crusty substance. It usually appears near the joint, between the toes and the feet. It is caused by a mite that bores under the scales of the legs and burrows deep into the tissues. Foul roosting quarters, dry and barren quarters, fowls ranging on alkali soil, and ash filled yards favor its spread among a flock.

After having picked out the most promising specimens for exhibition, allowing for ample substitutes in the event some birds do not fit up as one desires, and after being assured that the proper treatment of legs and toes has been administered, we are now ready to begin training the bird.

If it is possible to use small fitting houses for heavier weight breeds, such as American and Asiatic fowls, a great portion of a fitting period, only caging the fowls a small portion of the time and alternating them back and forth from house to cage, this method is much preferred; but in the lighter weight breeds, such as Leghorns, Polish, Anconas, and the like, it is better to place them in exhibition coops and visit them daily—the more often the better. At visiting times, they should be treated in a very gentle manner. They should become accustomed to being moved around in the pen with the point of a stick, as the judge will do this to determine their carriage or symmetry.

In the show room, the judge must pass upon the birds just as he finds them in the cage. You cannot take into consideration the fact that while in your yard at home your bird carried his tail lower; that his comb was straight; or that he stood in a more natural position, showing a better shaped back, breast, neck, etc. The official jurges the bird just as he finds it, and he has very little time to try to make any bird pose.

If the qualities of two birds are very near equal, as far as points are concerned, a judge is more likely to give the first place to the bird that behaves himself better, has a better disposition, and, in fact, is a better trained specimen.

It is never advisable to cage two or more birds together, in training them for exhibition. There is danger of the birds fighting, and destroying each others plumage or bruising their legs, and especially is there danger of bruising and discoloring their ear-lobes, face and comb.

What is known as short shavings or sawdust chips, which appears to be a mixture of shavings and sawdust chips, is the best material to use for bedding in coops used for training birds or in shipping them to the show room. While training birds in exhibition coops, they will not need the same diet as when on the range or in the conditioning yards or moulting pens. They should, for the most part, be given hard dry grain supplied to them in a can or vessel attached to the front of their coops. No changes in feeding should be made suddenly, however. This should be made gradually. They should be supplied with a small amount of hard grit every third day while confined to exhibition coops. The usual amount, one square inch, of succulent green feed should be supplied them daily. In placing fowls in training coops, they should be carefully weighed and records made of same. They should then be fed to meet the requirements of flesh, feathers and head point development.

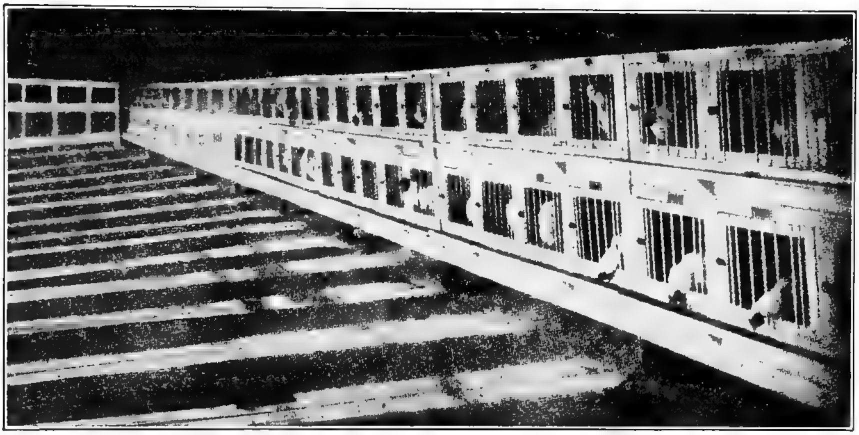


Fig. 10

Fig. 10 shows an interior view of a fitting and conditioning room on the farm of Charles Keeler, the noted White Wyandotte breeder of Winnomack, Indiana. The writer helped design and construct this fitting and conditioning house. The long room contains a double deck row of exhibition coops permanently built in. The feeding trough or table directly beneath the slatted openings is so constructed that it can be removed from each section. Each section contains four coops. This leaves a four-inch space immediately underneath the door through which the floor of the coop can be thoroughly cleaned without removing the birds from the cage. All feed and water is furnished from the feeding table. After this picture was taken small yards three by five feet were built on the floor directly in front of these cages, leaving only a four-foot aisle between the cages and the small yards. The small yards have wood partitions, two feet high, to prevent females from fighting. A dropping board six inches off the floor, together with detachable roost poles, was so built as to permit folding them up against the partition, thus leaving the entire floor space free. Four to six females were kept in each yard, and it was in these small yards that Mr. Keeler successfully conditioned his females while the male birds were kept in the exhibition coops. Immediately adjoining is the main drying room in this conditioning house. Stairs lead down from that room to the wash room on the floor below, and adjoining the wash room is the first room containing exhibition coops in which the candidates for washing are placed. They are taken from the latter room into the wash room and thoroughly washed, then taken up stairs and are placed in the drying room. When they have the appearance of being fully dry they are removed from the drying coop and placed in the cages illustrated above.

In handling or training your birds, each time you visit their cages it is well to place your hand in the coop quietly and with no show of nervousness. Gently put your hand towards their head and rub your finger between the wattles and under the beak.

If you will do this, your birds will become quite tame. After a few days, it is a good idea to stroke the back and tail occasionally by gently rubbing your hand over their feathers.

If the bird is inclined to carry its tail a little too high work with the fowl until you gradually lower the tail. You can often get it to pose in the correct position every time a judge or a stranger attempts to handle it, or touch it with a judging stick. It will require patience and days of careful handling, but a blue ribbon in a large show and the advertising of same justifies these efforts.

A small round stick about 18 inches or two feet in length is a very good thing to use in training your bird. Use this often, in place of the hand, as no doubt the judge will use something similar in judging the bird for shape and symmetry. Gentle handling and continual posing will finally result in birds assuming the desired positions whenever the judge's stick is pointed through the wires of the training or exhibition coops.

When first placed in the training coops, especially if the birds appear to be wild, it is a good idea to allow them to fast just a little, so that they will welcome you when you go to feed them.

It is all right to admit visitors to your training quarters, but it is not advisable, in preparing birds for exhibition, to allow visitors to remove them from the coops and handle the plumage, and by no means during the first period of training the birds should any outsider handle them. Too often they are unacquainted with the peculiarities of that particular bird, and, furthermore, they may not be efficient in taking a bird from the show coop in the proper manner. We have known many promising show birds to become ruined for a show by the wing or tail plumage becoming broken, the result of just such a practice. Visitors walking to and fro in front of their cages, however, is a good thing, as it helps to accustom fowls to strange faces and voices.

If you have any pampering to do, such as feeding them delicate bits, etc., do this while training the fowls at your own farm or home, and not after you have the bird in the show.

Some fowls, which are otherwise exceptional in quality, may stand in a slightly unbalanced position, which gives their bodies the appearance of tilting forward. In such cases, it is well to darken the lower three-fourths of the training cages and place all feed and drinking water at the edge of the open space, which will be high up towards the top of the coop. This trains the bird to stand in a more erect position, as he must do so in order to either see out, eat or drink. On the other hand, we find birds inclined to rear high in standing, almost straight up like an Indian Runner Duck, thus making them entirely out of balance. Such birds should have the upper three-fourths of the coop front darkened and all feed and water placed at a low point.

Birds that are already well balanced should have the upper first quarter and the lower quarter of their coops darkened, thus causing the bird to stand at its natural balance or pose while in the training coops.

After all, it is an easy matter to teach your birds to pose, eat from your hands, and act with a high degree of intelligence when either you or the judge approaches the front of their cage. This cannot be done within a day or two. It will require weeks of patience, gentle handling and training before the bird is properly fitted and in perfect show condition.

No bird should be placed in the training coops and left there for too long a period, just prior to a show. They are too apt to grow stale. They should be given a little exercise at least every third day. Though it largely depends upon the fowls and the way they were bred and have been raised, the usual period for training is not over ten days. Even then about twenty to twenty-five per cent of that time should be consumed in scratching around in larger quarters, on a floor covered with clean litter.

Show room form or condition is the form exhibited by fowls placed in the coop for exhibition. In some cases, this form is natural, but in most cases it is made or trained. The method of obtaining the form is never considered by the judge. The fowls are judged by the actual form in which they pose, and their behavior during the time they are being judged.

When a fowl appears at ease in an exhibition coop at a poultry show and does not attempt to interfere with or attract the attention of other fowls, it has good coop manners. A very good way to insure coop manners is to teach birds intended for exhibition to be accustomed to the presence of other fowls. This, of course, is not easy, because, as we have stated before, it is better not to have two birds in a cage together, with this one exception, i. e., in the event you are going to make an exhibit of a display pen, exhibition or breeding pen, four to six females should be trained together. so that the four most likely specimens, those that match and fit the best, can be entered at the exhibit without danger of their quarreling and fighting with one another.

Females being fitted for exhibition should often have a small and rather young male placed in their coops for ten or fifteen minutes each day. By this method, they will not appear to a disadvantage when placed in range with male birds at the show.

No fitter can ever afford to become angry or in any way lose his good disposition while handling or fitting a bird regardless of what it may do.

In order that a fowl may show to the best advantage it must be absolutely fearless. Fowls should never be frightened and they should gradually become accustomed to as many people and strange things as possible, such as children, dogs, and various other objects that may be in the average show room. Training coops should be placed where there is plenty of light and where the trainer has to pass often. This will accustom the fowls to having people pass.

Try and teach your fowls to pose, but never attempt to force a fowl to pose in any particular position. Instead offer it short bits of food. When a fowl has hopes of receiving food, it will pose in an alert position that it is impossible to obtain in any other way. Every time the fitter approaches a coop he should give the fowl a morsel to eat. Fowls will soon look for you and will assume the pose and look for the food they expect.

Habits formed by your fowls during the training period will cling to them during the show; therefore, to get a fowl to pose attractively, remember it must be taught to expect attention whenever any person approaches the coop. To impress this idea on the mind of the fowl, a fitter should never approach the coop without paying some attention to the bird within. If this is done, and if it is fed occasionally from the hand, it will bbe noticeable that during an exhibition that fowl will pose for any person, in the hope of receiving a morsel of food. If a fowl ordinarily gives its best appearance by standing in a position facing the coop, it is then best, at times when it is fed from the fingers, to hold the hand exactly in front of the coop at about the proper height in order to make the bird appear at its best. If the bird appears better from a side or profile view, then your object should be to stand it sideways, and the feed should be held to one side. If all are trained this way, they will always come to the front of the coop when a person approaches and will never cringe or cower in the back part of their cages.

A fowl that will shrink its feathers in and cower away from the judge as though afraid cannot be expected to win if competition is the least bit keen.

We have known some very successful trainers to hold a bit of choice feed between their lips instead of in their fingers and allow the fowl to pick it out. A fowl so trained will be alert when a judge puts his head near the coop to get a close view of it.

In handling your fowls during the fitting and training period, it is well to stroke their plumage towards the lay of the feathers in all such varieties that have tight plumage, such as Leghorns, Anconas, Minorcas and the like, but the plumage of loose feathered or fluffy fowls, such as the Orpington, Wyandotte, and the like, should be frequently pulled upward or backward from the rear, drawing them gently up against the lay of the feathers for the full length of the body. This aids to some degree in bringing out the shape desired, but care must be exercised not to bruise any growing feathers.

Old plumage which is ripe and brittle will not stand more than one washing, as a rule. However, some breeders wash old fowls twice to assist the moult. In the case of young white birds, or old fowls that have moulted the old plumage and grown a full cloak of new, it is advisable to wash them thoroughly three times prior to an exhibition. Ten days to two weeks should elapse between these washings. This, in itself, is a great aid in training and taming birds.

The toilet of one's fowls is a most important factor. In conditioning varieties having a color of plumage which should not be washed, it is well to spend a few minutes each day while the birds are being trained in helping them prepare their toilet, improving the luster and cleanliness of their plumage. Use a soft cloth. Beginning at the base of the comb rub down with an easy motion, covering every portion of the bird. At the end of a week or ten days, the bird will have a beautiful luster. When the bird is not in its training coop, it should be in a small house, with a clean floor of from six to ten inches of good, clean bedding.

Silver Wyandottes, Barred Plymouth Rocks and golden buff colored birds will show the effect of dirt on their plumage in such a way that it will be almost as noticeable as in the case of white birds, and, for that reason, breeders must be especially careful to thoroughly cleanse their plumage before exhibiting. In some cases, it is even advisable to thoroughly wash parti-colored birds five or six weeks before an exhibition. Hand rub them occasionally, and do this frequently during the last week or ten days prior to the show.

WASHING WHITE FOWLS FOR EXHIBITION

Chapter 10

The highest art in the process of properly fitting and conditioning birds for exhibition is in washing them. Beyond any question, more promising birds are ruined for exhibition in keen competition by inexperienced people, improper washing and drying of plumage, than from any other cause. It can also be said that more fowls of a lesser degree of quality are improved to the point where a winning in keen competition is possible through a thoroughly efficient washing, drying and grooming by the hand of an artist, than from any other cause.

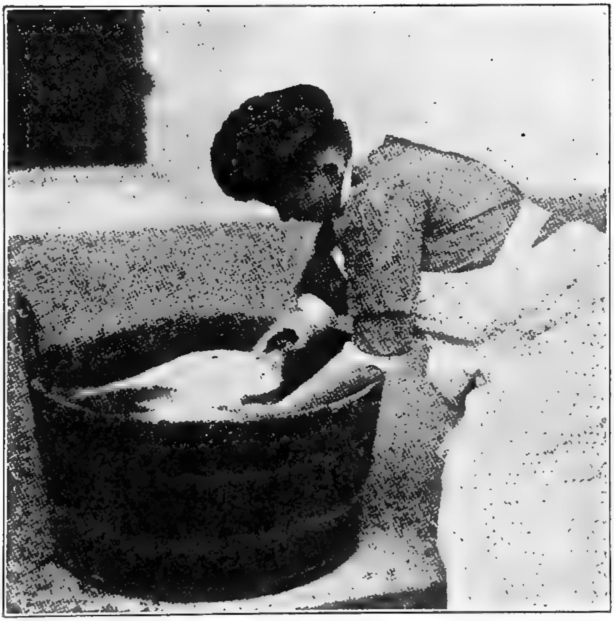


Fig. 11

Fig. 11—This shows the first stage of washing a fowl where one is unable to have an assistant to help in the work. The washing of a bird, to prepare it properly, can well be divided into four stages. The picture above illustrates the first stage which consists of plunging the bird into water, thoroughly wetting its entire plumage.

Washing fowls for exhibition is indeed of the utmost importance, and it also means much real work, but if we will remember that the crowning glory and the fruits of our years of labor are made known through the show room, we can stand the hard labor.

It is in the show room that we view our labors of the past seasons. It is there that our successes and failures manifest themselves; it is there that we turn our thoughts to the days to come and begin to lay plans for the future advertising and selling of our products.

The true fancier and breeder gains this advantage by a victory in the show room. He knows that this victory is noted by many of next year's prospective buyers, not only at home, but also abroad. Thus, it behooves him to look to his laurels, as well as to his plans for next year's work. With these thoughts in mind it will pay anyone to disregard the labor, inconveniences and small added expenses which are necessary to properly prepare, educate, wash and dry our fowls. After all, washing fowls is not such a difficult performance, once we learn the proper knack.

Breeders who have been exhibiting birds for a number of years, and who produce a considerable number of choice specimens annually, preparing them for their own exhibiting or for the use of customers, usually have a specially built washing room and quarters for properly drying and grooming the birds.

The average breeder depends much on a clean, well ventilated outbuilding or upon a clean sanitary basement, or, in many cases, upon his good wife's kitchen. In any event, everything should be ready for completing the job before one starts.

It is a mistake to close a room too tightly in order to keep it sufficiently warm. Ample ventilation is essential to proper drying; also, moisture provided in some manner close to the drying coops is necessary, or the fowls will not fluff out properly, neither will their plumage show the desired finish or lustre.

We know of one of the most successful breeders and fitters in America, who uses two rooms, one for washing and the other for drying. The partition between the two rooms has a large hole cut in it like a double doorway. The stove for heating the water is placed in this opening. On top of the stove is a large open iron kettle, in which he keeps water boiling continuously. Naturally, the steam from it filters into the drying room. Birds which dry out too rapidly, as a result of dry, harsh, hot air, in which there is no moisture, never look as good as those which dry slowly, and in an air moistened warm room.

After selecting a proper room or pair of rooms for washing and drying the birds, all unnecessary furniture should be removed. A good fire should be started in both the washing and drying rooms for properly heating the water to be used and for drying the birds. Rain water, if clean, is much preferred to hard water. If it is necessary to use hard water, it should be softened by the use of one heaping teacupful of Mule Team Borax to each boilerful of water.

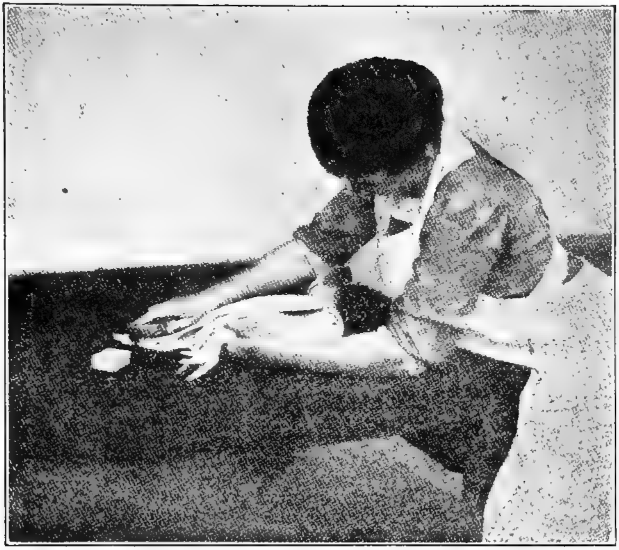


Fig. 12.

The above illustration shows the second stage described in our text matter, that of using the soft brush with which to scrub the feathers . After the plumage has been thoroughly wet, soaped and scrubbed by hand and the most of the dirt washed out, then the bird should be soaped again and gently scrubbed with the brush.

In properly washing birds, the operator needs a good assistant and none better can be found than a good, patient woman. You should next prepare the room to be used for drying, which must be thoroughly clean. Sprinkle the drying coop floors with two inches of sawdust. This kind of litter absorbs the droppings better than any other kind. It is not so likely to stain the breast and lower fluff plumage of the fowl. Coops should be arranged quite close to the source of heat, but provision must be made for plenty of space to permit moving them back from the heat, a few inches at a time, after the fowls start drying. If it is possible to have steaming water on top of the source of heat for drying, or to provide any other means which will insure more or less steam in the drying room be sure to do so.

It is especially necessary that there be moisture in the drying room **by the time the fowls are three-fourths dry.** Prepare cages, in cool quarters, for the fowls prior to their being washed. Have the fowls that are to be washed in these cages as close as possible to the washing room, so that no time will be lost. They should be so arranged that it will be unnecessary for the washer or his assistant to leave the warm air of the washing or drying room and expose themselves to a cooler temperature in going after a bird that is to be washed. If we were building a fitting and conditioning room to be used for washing, we would certainly arrange a room for each division of work. First of all, the room for fitting and training should be well ventilated and well lighted. The next room should be the drying room, and the size of this would depend upon the probable number of birds that are likely to be washed in any one day. We also prefer a separate wash room.

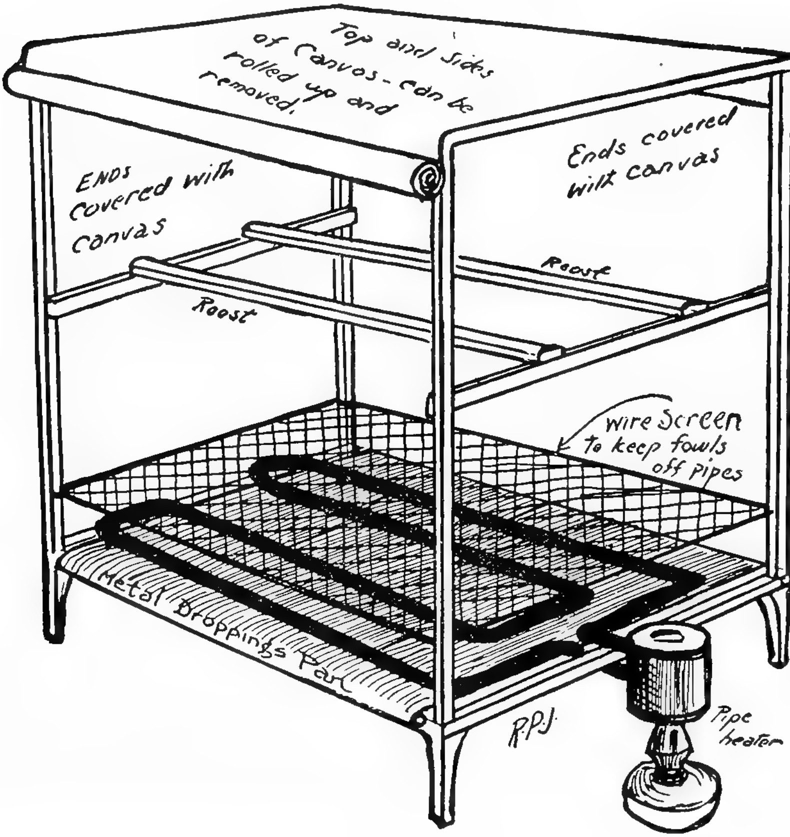


Fig. 26.

Through the courtesy of the Reliable Poultry Journal we are permitted to show this illustration of a specialty home-made drying coop for use in the washing of fowls for exhibition. In order to make one of these coops it is almost necessary to use the copper heater and tank as well as the lamp of an old incubator. The balance of the drying cage can be made according to the above plan and by following the illustration. We prefer drying fowls in cages, however, having but one fowl to the cage.

By the time the birds have been in the drying coop from eighteen to twenty-four hours, they could, if necessary, be removed and placed back in the coops of the training room, thus making additional space for other birds to be washed. With arrangements made for caging the fowls that have to be washed, and for properly caging them during the drying period, we are now ready to provide the necessary appliances for washing the fowls. These consist of four large tubs which are thoroughly clean, two boilers, and an ample supply of rain water, if it is possible to obtain same. We should have a good sized dipper, two pails for transferring water from the boilers to the tubs and also for providing plenty of fresh water for rinsing and bluing.

It is well to have a good stiff brush for brushing and cleaning the feet and toes, and another brush, with soft fibres, for use on the plumage. This will be described later. It is also advisable to have two good stout sponges and a certain quantity of hydrogen of peroxide on hand.

In washing the fowls, if they are fairly dirty, each tub of water should be emptied and fresh water supplied every fourth to sixth bird. This is especially necessary in the case of the three tubs containing the two rinsing and one bluing waters.

While the water is becoming hot in the boiler, take a certain amount of White Ivory or Williams' shaving soap according to the number of birds to be washed and cut it into real thin slices, placing same over the fire in a vessel of hot water until it is boiled and thoroughly dissolved. One bar of soap should also be shaved into the boiler and allowed to thoroughly dissoslve.

One boiler must have clear water. By the time this has been heated, place about six to eight inches of good warm water into your first tub, which contains the soapy water. It should not be too hot, but should be hot enough to hold one's elbow in comfortably, say 110 degrees of heat. The next tub should be half filled with water not quite so hot, say 90 degrees; the fourth tub should be fairly well filled with clear water, which should be quite cold. The water in the fourth tub must have bluing in it. We prefer using Ball Bluing instead of Liquid Bluing. The Ball Bluing can be better mixed with the water without any danger of an overabundance adhering to the sides of the tub. It is well to take four or five balls of the Ball Bluing and wrap them in a muslin cloth, tying same securely with a string. Mash balls in this sack. Blue the water to about the same color as you would use for ordinary white clothing if you are intending to wash birds that are to be exhibited within two to five days, but if you are intending to put your birds through two or three washes and are beginning to wash your birds four or five weeks prior to an exhibition then it is advisable to put more bluing in the water for the first washing Color it sufficiently so that the birds will look quite blue when removed from the bluing water, and even after they are thoroughly dry. This will gradually bleach out in the course of a few days and will leave the bird whiter. Subsequent washings will remove any bluing that has not already disappeared, as a result of the air and other elements.

We are now ready to begin washing the bird. It is advisable to place the bird in the first tub standing firmly on both feet, having your assistant on the side of the tub opposite the head of the bird. The assistant should reach over, grasp the bird by both shoulders, close to the body and gradually submerging the bird, with the exception of the head and the upper part of the neck. Care should always be taken to prevent the bird from swallowing any soapy water, as this acts quite freely on the bowels and often results in staining the plumage while the fowl is drying.

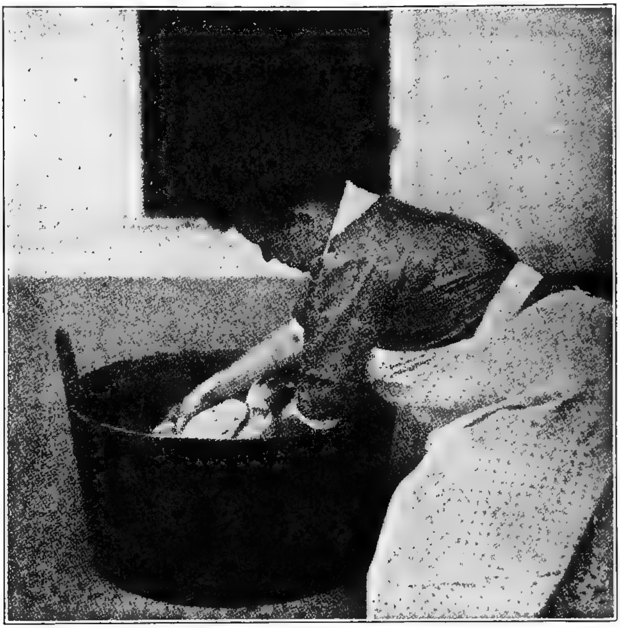


Fig 13.

Fig. 13 represents the rinsing of a bird. We cannot afford to neglect the thorough rinsing of the bird. The wings represent a section that all too often are not thoroughly rinsed. The entire bird must be thoroughly dipped and washed in this warm rinse water until not a particle of soap is left.

It is at this point that the washer must exercise the highest of all virtues—patience. Take it easy for a while. holding the bird down in the water partly immersed, then begin spraying water over the back and wing bows of the bird, using a good sized sponge and rubbing with the web of the feathers as they lay. Never rub against the web of the feathers until the fowl is thoroughly wet to the skin. The washer should always have the bird facing him. You will not find it a very difficult job to get all the feathers wet, and when this is done pour the melted soap, or at least a portion of it, into your heated water. Make a good lather and do not be afraid of dipping your sponge in the melted soap and applying same direct to the plumage of the bird, as rubbing it into the plumage of the bird will assisst greatly in making up a desirable lather and will aid towards loosening the dirt from the feathers. Scrubbing the plumage with soap and lather cuts and loosens dirt, but it must be washed and rinsed out.

After the bird's feathers are thoroughly wet, you can rub them sidewise, but never rub them against the web until the feathers are wet to the skin. As you are going over the shoulders, wing-bows, back and under section of the bird begin parting the feathers with your left hand, pulling them back so that the bird's flesh is visible. Cease rubbing or washing for a few moments and take your dipper or tin cup in the other hand and dip it into the water pouring it into the feathers thus washing out some of the dirt which you have already loosened from the feather web By this time your fowl will have its feet and legs thoroughly soaked by the hot water. It should now be removed and placed quickly in the hammock. With the stiff brush, previously mentioned, go over its legs and toes thoroughly, especially the toes, as it is here so many overlook proper grooming. Do not let this operation, however, consume over two or three minutes, after which the bird should again be placed in the water and washed thoroughly, section by section. Start with its neck and do not overlook that portion immediately underneath the wattles and earlobes. Follow down to the under portion of the hackle where it laps over on to the shoulders. Thoroughly wash the wing bows. Open out each wing and wash the main wing feathers on both the upper and underneath side. Then work thoroughly over the back, down over the hips and on to the sides of the bird underneath the wings.

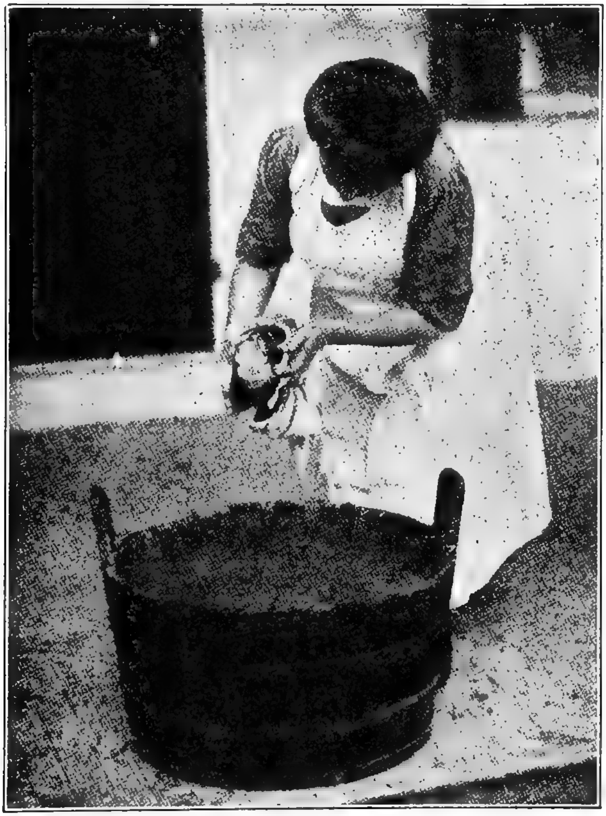


Fig. 14.

The last stage of washing, so often practiced by many very successful washers and exhibitors. Personally, we have had our best results when we did not dry or wrap the birds in towels, but placed them, directly from the bluing tub, into the drying room cages.

Extra precaution must be taken to get all the dirt out at the base of the tail. Many overlook this section. Be very thorough, also, in washing the body fluff, underneath the tail, and about the abdomen.

You are now ready to have your assistant hold the bird up by one wing shoulder and by one leg. Thoroughly wash the thighs and around the hock joints and put in extra work in thoroughly washing the breast, as many birds have their breast feathers partially stained. You may have to wash these feathers with the soapy water two or three times in order to get the loosened dirt out, and then re-scrub the breast again with a soapy lather.

You will find that you can hold a bird's body under water for some minutes and when taken out the under portion of its feathers in many parts are not rinsed out, or, if the bird has been dry previously, they will not be wet at all.

One of the great secrets of a successful wash is, first, to thoroughly wet the feathers all over down next to its skin before applying any soap; second, thoroughly open up the plumage and rinse out the dirty water and then resoap with fresh soda and melted soap. By this time you can disabuse your mind of the idea that you are handling something that is brittle and likely to break, for when the feathers are once thoroughly soaked you may treat them as you would a piece of flannel, rubbing them backward, sidewise and forward and completely getting every particle of dirt washed out.

We have had our greatest success by taking the soft brush mentioned above and thoroughly brushing with the lay of the feathers, those of the neck, shoulders, main wing, back, saddle, breast and tail. This will more thoroughly part the web of the feathers and often loosens up the dirt, which ordinary rubbing and scrubbing does not do. We next take some of the melted lather, which by this time should be sufficiently cool to permit the placing of one's hand in it, rub just a little of this over the surface of the bird and then proceed to sponge it in. Wash the lather out as much as you can with the hot water, and remove the bird from this tub. Place the bird in the next tub of hot water. Many make the mistake of having their second tub of water too cool. This often sets the dirt and soapy water, and results in some of the dirt clinging to the fowl's plumage. In the second tub get every atom of the soapy water possible rinsed out of the bird's plumage, after which take the bird out and place it in the third tub, which is also warm, but not as hot as the two previous tubs of water. Go through the same process of rinsing it, only be even more thorough. When you think you have every bit of soapy water rinsed out, rinse it some more for good measure. The eye cannot detect the remaining soapy water, but an experienced washer will be able to tell by feeling the surface of the feathers. However, it is underneath, at the base of the tail and underneath the wings, between the thighs and lower abdomen, that so many breeders fail to get all of the soap out, and unless the soap is all removed the plumage will not dry and fluff out as it should.

After you have thoroughly rinsed the fowl, it is well to hold its feet up, permitting its head to hang down. Hold the fowl first by one leg, then by the other, and use your dipper freely, pouring water down over the thighs through the back, tail, wing, breast and feathers of all sections. Then stand your bird on both legs and submerge him in water, which will serve to straighten out the feathers and make them lie down on the body in their natural direction.

You are now ready to put the bird in the bluing water. Before a bird is placed in freshly prepared bluing water, a cloth should be run through same to take up surplus bluing. Stir your bluing water up just a little, then submerge your bird as quickly as possible, and in addition to doing this hold him up by the legs in the manner described for rinsing and pour the bluing water so that it will thoroughly pass its way through the under portion of the bird's plumage in every section.

Again stand the bird on both feet in the bluing water, place both hands on his shoulders and press him down underneath the water, with the exception of his head and mouth. This will result in straightening out the feathers so they will lay properly, which is quite necessary before the bird is placed in a drying coop. Placing one hand on the outside of each shoulder and, with your fingers underneath the breast, gently life your bird up. Hold it firmly. Bring it up level with your head and give it one shake downward. Carry it quickly to the drying coop, placed fairly close to some source of heat.

The proper temperature in the drying room should be about 95 degrees, and should be at a point level with the center of the coop. However, before we pass from the washing to the drying period, there are two or three things which do not apply in all cases, which it is well to remember while washing fowls. Oftentimes we have birds to wash that have permitted the tips of their wing feathers to become stained or discolored. This is also true in the case of Cochins, Light Brahmas, or other feather legged fowls, and in the event of such a case it is desirable to thoroughly wash the tips of the wing feathers or foot feathering before going through the full process of washing the bird as a whole.

A few words especially pertaining to the washing of the head will not be amiss. Take the head and place it between both hands, rubbing your hands backwards and forwards, as if you were washing a ball, and going on down do the same with the neck, continually using a little lather or melted soap.

Do not, under any circumstances, use towels or cloths to endeavor to rub fowls partially dry. We have had much better success where we have allowed the birds to drip dry. Do not make any effort to squeeze or wring the water from the bird's plumage, especially from tail or saddle feathers.

It is useless to attempt to apply any bleaching liquid at this state, for the water, in dripping from the fowl's plumage, will carry the bleaching compound away with it.

If you have a bird which has many partially matured feathers, these will give white birds a creamy appearance. It is well to use hydrogen of peroxide quite freely, but if this is to be used wait until your bird is a little dry. The proper time is when the bird is partially dry around the head, which will be easily noticed. By this time the majority of the water which is going to drip freely from the bird's body will have done so and you are free to remove the bird from the drying coop, then with a small sponge thoroughly saturated with peroxide go over the feathers, parting them sideways and getting the peroxide into every section and into the underfeathers of the fowl.

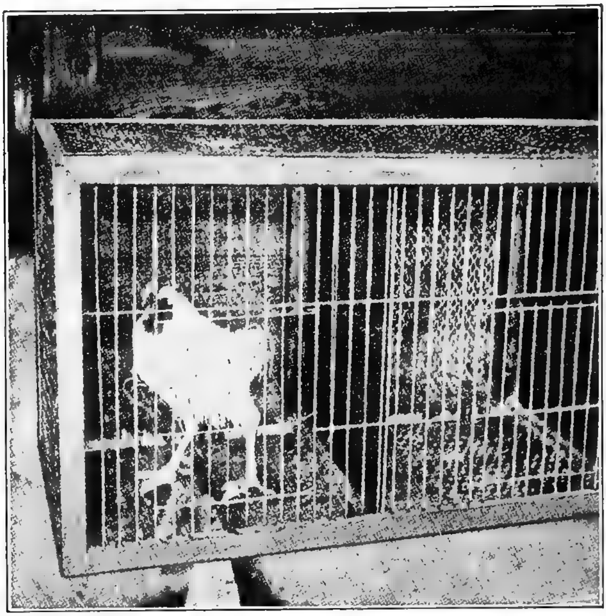


Fig. 15 shows a bird when first taken from the last bluing and rinsing water and placed in its drying coop. A pretty sorry looking specimen just now, but a few days later this particular cock bird was a first prize winner in one of the largest shows of the country.

In case you have birds which are decidedly creamy colored, in fact, inclined towards "brassiness," you will find that it will take several applications of peroxide to remove this color. It is such birds as those showing "brassiness" on the surface that you should start washing several weeks before the show. The elements and air following the use of the peroxide is what does the work. You cannot expect the instant touch of the peroxide to turn a creamy colored or brassy feather white. Most all white birds have a little creaminess, and as long as the Standard calls for a popcorn white color you will find that the majority of the experienced breeders will use some process of whitening their birds so as to better suit the eye of the judge. Furthermore, the use of hydrogen peroxide, "H_2O_2," gives the feathers a glossy appearance.

After having gone over the bird with hydrogen peroxide, it is often advisable to dampen a cloth with a few drops of spirits of ammonia, applying this overly strong. Care must be taken not to let the peroxide get on the legs or feet of yellow skin fowls, as this will bleach them. This is not wanted, for they should retain their yellowish color.

While drying observe the bird often to be sure they are not drying too fast, for if they dry too fast their feathers will curl. This will spoil them and it can never be fully remedied. Plenty of fresh air; plenty of moisture; heat averaging around 90 degrees; gradually removing the bird away from the main source of heat, a few inches at a time, and permitting them to dry slowly; and allowing from eighteen to twenty-four hours before they become thoroughly dry are the necessary points that will mean success in properly drying fowls. Furthermore, birds should not be handled and removed from the coops while drying, if it can be avoided, other than the first removal for the purpose of using the bleaching preparations, as before mentioned.

If any droppings are noticed on the floor of the drying coops they should be removed with a piece of pasteboard, for if the bird should sit down it would very likely stain its breast and fluff feathers.

In the course of twelve or fifteen hours, the bird will give an appearance of being thoroughly dry, but a careful examination will show that in the heavy feathered sections and underneath the wing the bird is likely to be quite damp close to the skin.

In some varieties it is advisable to use either a palm leaf fan, an ordinary electric fan, or an electric hair dryer, such as is used by barbers for drying the hair of their customers.

The fanning process, however, should never be used on varieties which should have a hard, firm appearing body, such as Leghorns, etc., but in the case of Wyandottes, Orpingtons, Brahmas, Cochins and varieties that should be loose feathered it is advisable to use some method of fanning the plumage. For example: If you have an Orpington that is not quite broad enough appearing or hardly full enough in the appearance of the breast, you can hold the bird so that the air from the fan will blow the breast feathers out and upward. This causes them to finish drying in a fluffy and loose way.

In the case of the bird appearing too narrow, blow the thigh feathers, the plumage between the thighs, and the body fluff feathers back against the grain. If, in the case of an Orpington or Wyandotte, the back is a trifle long or flat, blow the back feathers backwards, which will cause same to become more fluffy and lay more loosely at the junction of back and tail. This gives a more gradual slant and approach from back to tail and often greatly improves the general appearance of the specimen.

Many exhibitors use cornstarch or other powder and thoroughly dust the birds when they are dry, and before starting them on their way to the exhibition. This is done on the theory that any dirt that settles on the plumage will be removed by the starch as it works upward and outward. This practice, however, has been done away with by the more prominent and successful exhibitors of the present day. It seems to affect the beautiful natural surface appearance of the fowl and, furthermore, is very distasteful to the judges and to visitors who might have occasion to handle the birds.

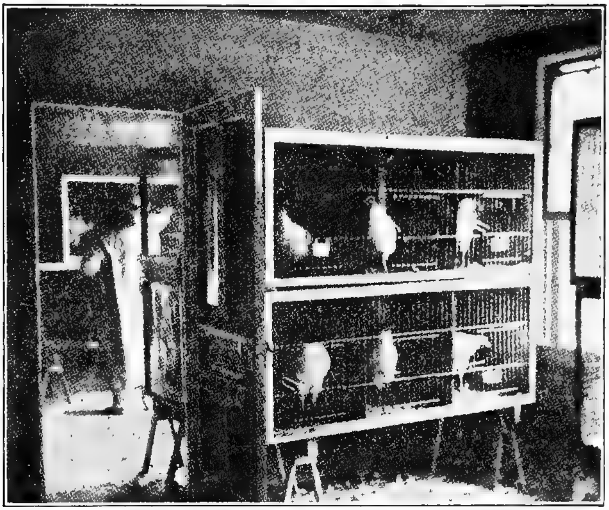


Fig. 16 shows two rooms for training and drying. The first room contains the drying cages which have been moved back against the wall in order to have them as far as possible from the main source of heat while the birds gradually become dryer. In the next room, where the temperature is considerably cooler, the birds are permitted to finish their drying process for perhaps six to ten hours before they are placed in the shipping boxes to be sent away, by express, to the exhibition.

By this time you will be able to observe the result of your work, although it may be that another ten or twelve hours will make your birds appear to better advantage.

If any of the fowls which are thoroughly dry appear a little sticky and do not open nice and fluffy, which will not be the case if your rinsing, bluing and drying has been properly done, place your boiler and tubs in order again and with clean water go through the work of rinsing, bleaching and drying of those particular birds a second time.

After your birds are thoroughly washed and dried, ready to be placed in their shipping coops, place them back in their drying coops, or, if you are so equipped, place them into clean, freshly bedded exhibition coops in your training room until you are ready to box and ship them away to the show.

During the drying process and this time do not give the birds any more water to drink than they will consume quickly, but give them a little water several times during the course of a day. Feed them only on hard grains. This hard grain should be supplied in a cup attached to the front of their cages. In carrying birds from one room to another, both at this time and while they are in their cages, see that they are not in a draught or where they are libale to catch cold. If you are unable to use sawdust chips for bedding, use only good, clean, bright straw. This is preferred to hay, alfalfa leaves, or any other form of vegetable litter, as the latter kind all too often contains dust which discolors the plumage of the fowl.

It is well to thoroughly examine your white birds, going through the same process of handling section by section, as if you were the judge, judging the birds. In most any white birds you are apt to find an occasional feather with grey or black specks on it, and the whiter they are the more apt you are to find this off-colored feather. If this appears in the quill in any section, except in the main tail or wing feathers, it is best to remove the feathers, but if the specks are out in the feather, the gray or black can be removed by the use of a pair of manicuring scissors. Simply clip the web at a point below the speck of off-color, or you might say between the speck and the quill of the feathers. If this speck of gray or black is of considerable size, it is then better to clip the web in a more or less ragged manner. A little practice will enable you to perfect this work.

Generally, it is not advisable to wash dark or parti-colored birds, although it is often done and a marked improvement shown, but in cases where such varieties are washed for exhibition it can be done considerably in advance of the show, and after the bird is thoroughly dry rub or polish him with a silk cloth. This will bring back the luster and improve the general color. Of course, in washing dark, buff or parti-colored birds never use bluing in the rinse water.

Many breeders improve the plumage of their parti-colored birds by taking a clean white handkerchief and holding it over steam from boiling water until it is quite moist. Using this go over the entire outer plumage of the bird, rubbing it gently, but constantly enough to remove the dirt and brighten the plumage. A sponge dampened with ammonia can also be used to advantage at this time. One week before the birds are to be shown they can be confined in large, clean, roomy coops or houses with plenty of clean straw for litter. If the birds are kept out of the sun and placed in a room with clean litter they will often do much toward cleaning themselves.

PREPARING EXHIBITION FOWLS FOR SHIPMENT

Chapter 11

A great deal more depends upon properly cooping your exhibition birds for shipment to shows than is generally believed. Many breeders try to be saving and in this desire they fail to use as many shipping coops as they should. Outside of females, intended for exhibition in an exhibition or display pen, not more than one bird should be placed in a coop. Male birds should always be placed in coops by themselves. Females entered in a single class should be cooped by themselves. Before cooping the birds, examine all the coops and be certain they are firmly put together. We have known cases where valuable birds had their legs broken on account of a board in the bottom of the coop becoming loose, permitting the foot to push through as it was being slid onto a truck or platform.

Examine every bird carefully before placing it in the shipping coop. Every section should be gone over once more very carefully, to make sure there are no off-colored feathers. In white birds look for flecking, either black or gray spots. In buff birds look for mealy or badly faded feathers, as well as any feathers at base of tail or neck showing white in the undercolor. In Red birds, look for feathers having smut in their undercolor, white at base of tail or neck; also remove any feathers which have "gone by," showing too much shaftiness or mealiness or a faded out color—appearing old. In Barred Plymouth Rocks go over every bird, section by section, looking for any feathers that are irregularly barred or black.

In the case of Silver or Golden Wyandottes, it is often advisable to pluck a few of the feathers from the breast, wing-bow, and back. This causes the open lacing effect to show off to a much better advantage. This is called the "thinning out" process. In addition to this, fowls of these varieties should be carefully examined for any feathers that have frosted edges, or where the back lace does not come clear around to the points of the feathers following the outer line of the surface to the under fluff of the feather, and same should be removed. We must remember that every variety produces quality birds that have here and there a sport feather, and it is a common practice to remove these at home while preparing the fowl for shipment.

In bedding shipping coops, we prefer to use the chipped sawdust shavings already mentioned in the chapter on washing.

Extreme care should be exercised in placing birds in the shipping coop. Have a sufficiently large opening at the top. Lift the bird gently out of his training or exhibition coop by reaching in and taking him by the shoulder with one hand and pulling him towards the exhibition coop door, place the forefinger of your free hand between its thighs, then lift it off its feet and out the door. Set the bird down in the shipping coop as gently as possible, making sure that his head and breast goes downward first. This will prevent any feathers becoming broken should the bird suddenly take a notion to flop his wings

There are many good chicken coops manufactured and offered for sale to poultrymen. We prefer one made of wood, as oftentimes the pasteboard coops become wet and are hardly strong enough to handle the birds safely. Shipping coops should be high enough to permit the bird to stand perfectly erect without his head and comb coming in contact with the top of the coop. Coops should not be too wide, but should be wide enough to hold the bird and not allow him to turn around in the coop. For every single bird of the American or English classes have a coop 22 inches high, 20 inches long and 10 inches wide. Female coops need not be so high, although it is better that they be too high than too low.

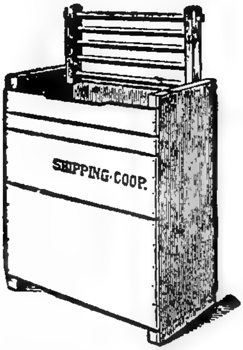

SHIPPING·COOP.

Fig. 17

This Fig. 17 shows an all wood shipping coop, which meets requirements for shipping birds for exhibition where the exhibition cages are furnished by the association. It is a very durable coop, one exceedingly handy for placing the birds in or removing same from it. Shipping coops like this are manufactured by the Empire Cooping Company of Fultonville, New York.

In warm weather, such as is usually had when shipping to a State Fair, one side of the coop should be open for ventilation and should be covered with fine mesh wire. Wire screening or mosquito netting is best if it is protected by strips of wood placed about three inches apart. This prevents anyone from bothering the birds while on the cars. In the case of white birds, however, the ventilation opening should be covered with medium woven muslin. This keeps dirt and the like from settling on the plumage of the bird. If your birds are likely to be on the road to the show for a period of more than twelve hours some provision for water should be made, with the exception of in the case of white birds. In the latter case, it is better to put in two or three quartered potatoes. They will get enough moisture from eating the potatoes to keep them in good condition, and this method will lessen the likelihood of staining their plumage. On any short shipment of any variety, potatoes should be placed in the coops.

Hinged covers on coops are a convenience and allow plenty of room to remove the bird without danger of breaking or soiling the plumage. If nailed on, as is generally the practice, only one slat is usually taken off, and it is a tight squeeze to get the fowl out through the small opening thus made.

At most shows, competent superintendents are provided and it is not necessary to go to the show to uncoop or to coop your own stock. This reference is made to the style of show that furnishes the exhibition cages. In other types of shows it is necessary to ship your birds in exhibition cages. It is, of course, desirable for you to be at the show if you can, but it is not necessary.

If you are showing a string of white birds and are in the show room when your birds are uncooped and placed in their exhibition cages, it is well to see that your fowls have had a satisfying, but limited drink of water at once, after which their water cans should be emptied. Very often birds will stain up their lower neck and breast plumage by slopping in too much water. It is advisable to purchase a sufficient quantity of cheap cloth and cover the cages containing your fowls until a short time before the judges begin their work. In the average show room a certain amount of dust is created through the work of straightening up the show, setting up the coops, uncooping fowls, and the like. A certain amount of this dust will quite naturally settle on the plumage of your well groomed birds. Every possible precaution should be taken to keep your fowls clean and spotless until the judging has been completed. Even then, it is desirable to keep your birds in the best possible condition throughout the entire week. Many exhibitors cover their cages every night at the closing hour of the show and remove the covering the first thing each morning.

TRICKS OF THE TRADE IN EXHIBITING POULTRY

Chapter 12

Changing or Switching Birds and Leg Bands

We do not wish to encourage faking, in fact, we want to discourage it, but we wish to encourage every legitimate practice that will give you an advantage. One thing which is often done in the show room prior to the hour when the judging begins is to switch birds to fit the competition. This means changing the band numbers on the birds as originally placed on them when they left home.

Usually the birds are cooped for a few hours before the judging begins. This gives you a chance to look over all the birds in the class. If you should have entered two single cockerels and you also have two other cockerels heading breeding pens, it is possible you will find that by having the best cockerels in the single class instead of in your exhibition pens that you could win first cockerel, whereas the pen class competition is so keen that even with your best cockerel heading your exhibition pen your best hope for an award would be second or third place; or the case might be reversed. You might find, in looking over competition, that the best cockerel you have is entered in the single class and the competition is too keen for its quality. He cannot win more than third or fourth place, but you could strengthen your exhibition pen by placing your best cockerel in it and removing the cockerel already in that pen, placing him in the single class. You would be sacrificing everything, no doubt, to win a place in the pen class, but increasing the likelihood of winning only second, third or fourth cockerel.

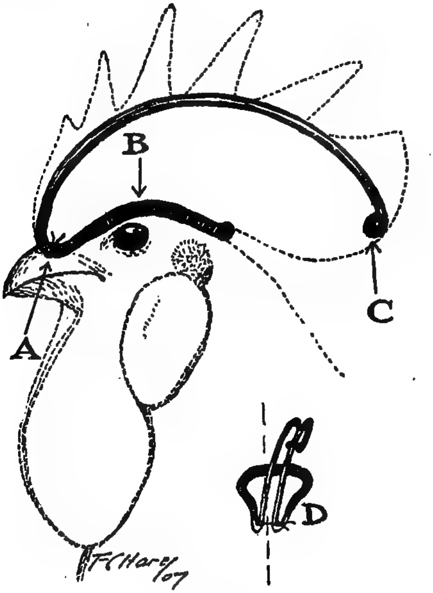
You might find, in looking over the pen classes, that you have first place won easily and that you can take one of the two pullets entered in the single class, the poorest one of the two, and place her in your exhibition pen without weakening it sufficiently to lose first pen. At the same time, remove the best pullet among the four in your exhibition pen and put her into the single class. This will give you a stronger chance of winning first and second pullets.

Never switch your bird to fit competition or for any other reason without also changing the leg bands so that they will correspond with the records and the secretary's books. This practice often gives you a big advantage over an exhibitor, and it is perfectly legitimate. The birds belong to you and you have a perfect right to exhibit any cockerel you have there and which is entered in the single classes or in the exhibition pen class, or whichever way you desire to place them. Whatever changing of the birds is done must be completed before the time the judging of your variety is to start.

By becoming a careful student of the Stardard requirements of your variety and by making a careful study of the class or competition, you can make wise changes before the judging is done. Very often this will result in a good winning where you might otherwise have won nothing.

How to Brighten the Color of Comb, Face and Wattles

For brightening the comb, face, and wattles of fowls, we have had our best success by using a cloth dipped in pure vinegar. This should be applied to the head points of the bird just before shipping to the show and again upon its arrival at the show, and especially early on the day when it is to be judged.



COMB GUARD

Fig. 18.

Fig. 18 shows a guard which is made of soft copper or brass wire of the above design. At "A" a thread twist is run with a needle through the nostrils and the guard is tied in position. The section marked "B" is wound with waxed string on top to prevent it marking, rubbing or irritating the flesh of the comb. The hooked point is to keep the point of the guard from pressing into the comb. "D" is the front view of a guard for a comb that leans to the left, opposite way to which the guard leans. Should the comb lean to the right the guard should lean in the opposite direction from this illustration.

How to Straighten a Comb When It Has Become Lopped Through Over-Heating or Through Pressing Against Coop

We have known many instances of fowls required to have a straight, single comb, which should stand erect, becoming heated en route to the show or after reaching the show room, resulting in the comb suddenly swelling. In this event, especially if it is very fine in texture and inclined to be thin, it will very often begin lopping to one side or the other. In cases of this kind, the best results will be obtained by purchasing six or eight ounces of pure ether. Saturate your handkerchief with the ether, hold the bird in your lap, place the cold, wet portion of the handkerchief over the comb of the bird and hold it there. It is not the mere contact of the ether onto the comb that will give you the desired result, but, with the ordinary comb, by applying this treatment for fifteen to thirty minutes at a time, putting the bird back into the cage for about one hour and then repeating the treatment, continuing this practice for five or six hours, you will find that, following the third or fifth treatment, the comb will have shrunken back to its natural size and will be perfectly straight.

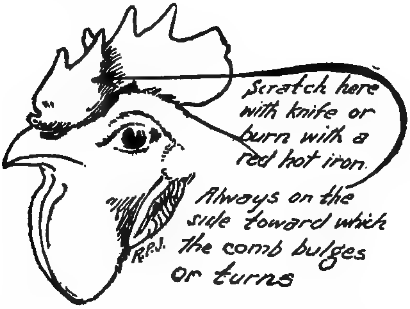

Scratch here with knife or burn with a red hot iron.
Always on the side toward which the comb bulges or turns
R.P.J.

Fig. 19.

Fig. 19—Feeding too much animal feed, meat, milk and the like often results in combs on youngsters, bred from ancestors with stout, firm, even, rigid comb, becoming twisted. Then, again this same defect is noticeable as a result of breeding. The arrow point in the above illustration indicates where to prick the comb with a needle point or to scratch lightly with the blade of a pen knife, in order to make it straighten up. Make it bleed and repeat the process if necessary.

A Frequent Cause of Large, Beefy and Lopped Combs

Many exhibitors, both before and during the show, make the serious mistake of feeding too heavily of fresh meat. The feeding of much meat to birds confined to a warm pen or show room will, in many cases, cause the combs to grow rapidly and develop beefiness, thus causing them to fall over to one side.

How Foreign Color Is Removed From Beaks

A small amount of black or brown color may sometimes be removed from yellow beaks by using fine sand-paper, the blunt edge of a broken bottle, or an ordinary finger-nail file. The beak should not be filed down enough to cause pain to the bird. If this is necessary, the defect is so deeply rooted that it cannot be removed.

How Ear-Lobes Are Treated to Improve the Color

In some cases of defective lobes, the white spot on a red ear-lobe can be dyed with vermillion or permanganate of potash. The proper strength of these dyes to use depends upon the shade and color of the lobe. There are no dyes that will completely cover large spots in enamel white. We do not recommend the use of vermillion or permanganate of potash. If one wants to stoop to the method of changing small white spots on a red ear-lobe, which in many varieties is a disqualification, the best results are obtained when using a small hypodermic needle. Get red ink about the correct shade to match the ear-lobe color and inject a small amount of this underneath the thin skin of the lobe where the white spot appears. Do not prick the skin deep enough to draw blood. Pleasing results may be obtained by applying oxide of zinc ointment to white ear-lobes that have become creamy. It should be rubbed well into the skin once a day. The dry powder may also be used if the lobes be well dampened and dried before appliance. There are acid treatments for ear-lobes, but it is cruel treatment and always leaves a scar.

Sometimes birds that are closely confined and have been highly fed for show condition will develop a mild form of eruption or circles on their ear-lobes which may be considered by the judge as an attempt to remove off-color. In such cases, give the bird ten grains of bicarbonate of potash and ten grains of Epsom Salts. Anoint the lobes with carbolated vaseline, rubbing it well into the skin.

Coloring Yellow Legs

The practice of coloring yellow legs, or rather those that are supposed to be yellow, but which are altogether too much a straw or light color, is in positive violation of the American Standard of Perfection and should not be practiced. However, many breeders use butter color for adding strength of color to the legs of yellow legged fowls. The recipe is three drops in a teaspoonful of sweet oil. Apply the mixture to the legs with a flannel cloth and avoid getting it into the plumage. Apply a very small amount at a time and rub it in well. Also, extremely light applications of iodine rubbed in well in the same manner will increase the color of yellow legs.

Remove Traces of Stubs From Legs

This is one of the worst forms of faking and is positively against show rules and the Standard of Perfection and should not be indulged in by any honest poultryman. Special treatment is not necessary where the defect consists of only down or very small stubs between the toes, but in the case of feathers or stubs along the sides of the legs being removed it will leave a hole which discloses the fact that they have been removed. These holes are sometimes plugged with soap or wax.

How to Strengthen Birds Which Suddenly Develop Leg Weakness Just Before or During an Exhibition

A forcing diet, such as is often necessary in getting birds in show condition, will sometimes produce leg weakness to such an extent that the bird can remain on its feet for only a few moments at a time. The treatment in such cases is as follows:

Sulphate of Iron	1 grain
Sulphate of Quinine	½ grain
Phosphate of Lime	1 grain
Strychnine	1-16 grain

This mixture should be made up into twelve pills of equal size and one given to the afflicted fowl each day.

How to Work on Back Plumage to Improve Both Back and Tail Shape

Great improvement may be made in the shape of the back and tail by manipulation of the feathers at or near the base of the tail. The bird must be washed, and when the feathers are damp, but in the process of drying, they should be slightly curved and fluffed into shape so the low place at the base of the tail is filled out considerably and a symmetrical curve of the back is secured. Many breeders have followed the practice of making a saddle out of cotton, and raising the feathers which lay over the base of the tail and placing the cotton saddle next to the flesh and letting the feathers lay over the cotton while they are still wet, permit them to dry in that position. If a bird has a cushion that is not desired, this can be lowered some by pulling out a good many of the rear back feathers here and there.

How to Prevent Diarrhea in Washed Birds

Often, during the process of washing a fowl, it will swallow more or less of the soapsuds and soapy water. This brings on diarrhea, as a rule. This, of course, has a tendency to soil the fluff plumage and may get the bird out of condition. Give it a good feed of boiled rice which has been liberally sprinkled with prepared powdered chalk.

How to Prevent Colds When Birds Are Washed

A wet bird placed in a slight draught will surely catch cold and make it unfit for showing. In cases where there seems to be any danger of this, give the bird three drops of spirits of camphor on a tablespoonful of mash food as soon after washing as it will eat.

How to Revive Birds Which Have Fainted While Being Washed

Oftentimes a bird will faint while being washed, on account of the water being too warm or from lack of proper ventilation in the room, and unless something is done to revive it at once the bird may not recover. In such cases, it should be removed from the tub as soon as the head and neck appear limp or there are any other indications of the fowl fainting and be immersed immediately in cool water.

This fainting condition is caused by the action upon the bird's heart produced by the water being too hot or too cold, by the shock of too sudden immersion, or by lack of ventilation in the room. Deaths may be prevented and the fainting spells eliminated by taking care that these causes are not present.

How White Tips Are Removed From the Main Wing Feathers of Dark Colored Fowls

Foreign color, lacing on the extreme edge of the feathers, or white tips are sometimes removed by wearing away the edge with pumice stone. A method more commonly practiced, however, is to slightly singe away the foreign color, following the general shape of the feather by the use of the red end of a lighted cigar.

How to Properly Handle a Bird

Be careful in taking fowls out of coops to prevent any injury to their plumage. Never grab them by the legs. Some reach over the fowls' backs and grab them by the wing on the far side and draw them out head first. An experienced hand can do this nicely, but others are liable to have trouble, as there is a certain knack in using this method. The best way for beginners is to reach in with the left hand, place the hand on the bird's back and at the same time place the right hand under him with the palm upwards, letting your first and second fingers go between the thighs, and with the other fingers outside each leg lift the bird towards you. With a little practice the fowl can easily and quickly be taken from the cage. Another way is to put one hand on the bird's back, work the hand down over the far side of the bird and at the same time place the right hand on the other side of the bird, thus covering the wings with the hands, and with a firm hold lift the bird up. He will draw up his feet, and he should be drawn out quickly before he has a chance to get a hold on the edge of the floor with his feet. Always remove the bird head first.

Preventing Tail Plumage From Becoming Spoiled

The tail feathers of exhibition fowls are often more or less rough or ragged along the edge of the web because of the perches being so close to the wall of the poultry house that the tails of the birds are constantly rubbed or pressed against the walls. The perches should be far enough away from the walls so that the feathers cannot touch it. The same is true in regard to the size of the opening which the birds pass through when leaving the house. Then again, very often the nest boxes are so low that the birds will continually have their plumage rubbed by these boxes as they pass to and fro.

How to Stop the Flow of Blood From Injured Combs or Wattles

In dressing wounds, especially those about the comb and head caused by fighting or from some other form of injury, the best remedy we know of is a powder known as Tanic acid. Place a pinch of this on the wounded spot and it will stop the flow of blood and cause it to heal quickly.

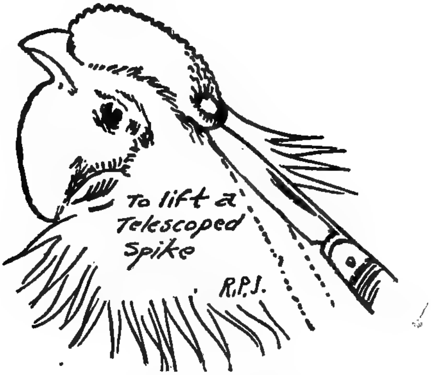

To lift a Telescoped Spike
R.P.J.

Fig. 22.

Fig. 22—Among Rose Comb varieties, occasionally, an unusually good specimen will be produced, having what is known as a telescope spike on the rear of the comb. If this is noticed when the bird is partially matured it can easily be overcome. Insert the point of a two edged knife between the skull bone and the "fleshy" part of the comb, as shown in the above illustration. The point of the knife will sever the cord which has drawn in and is holding the telescope point, or spike of the comb. In addition to severing this cord, press the point of the blade lightly upward. By pressing the comb with the thumb nails, on each side, the point will often "pop out," thus greatly improving the quality of the comb.

How to Improve the Appearance of Birds Lacking in Breast Shape

If your bird is hollow, or not sufficiently rounded in breast shape, it is well to determine the exact time the judging will begin. At least two hours before this time, purchase a loaf of bread and get your fowl to consume as many small pieces of this as possible. It will fill out his craw and improve the breast shape. If your birds are a little tall on their legs or lacking in fullness of breast or abdominal sections, it is well to provide an abundance of litter in the floor of the coop, especially around the outer edges. The reverse would be the case in the event the birds are inclined to be a trifle short. In this event, the less floor bedding the better.

PLAIN TALKS AND ADVICE TO EXHIBITORS

Chapter 13

Under no circumstances should you feel that a judge is prejudiced against you or your birds. Harsh words cause trouble and much unpleasantness to everybody concerned. If you have any just reason for believing a judge is prejudiced against you or your birds, it would be better for you to keep your birds at home and not send them to a show where this judge is officiating. Make it a point, regardless of what may happen, to always act like a lady or gentleman. Maintain your dignity, regardless of costs. Any demonstration of anger, any uncomplimentary remarks concerning a judge, the officers of an association, or your fellow exhibitors is bound to re-act and will turn people against you. You will thus lose the support you might otherwise have attained. Judges, like yourself, are only human, and are very likely to make mistakes. All of us, who do anything, do that. Mistakes are often made by some of our most learned judges in the highest courts in the land.

In the event that you are convinced that the judge has made a mistake in placing any award on your variety, it is much better to look him up in a very pleasant way and explain your view point and ask if, in his opinion, after considering the evidence you have given him, he has not made an error. If you can show that he has, and he admits it, but refused to correct it, you will then have cause for reporting the matter to the poultry show officials.

It is far better never to make a protest against the awards of the judges. It is very, very seldom that you will gain anything by it. It is much better to go to the judge and say, "Judge, I am confident that you have made a mistake in regard to such and such a variety. At least it looks like it to me. However, I am not saying a word to anyone other than to yourself. I wish you would go and look this up and in the event you are satisfied in your mind that I am right and that you did overlook it, you can remedy same by simply going to the officers and changing your award."

Regardless of what the judge does, you should never sign a protest unless you are absolutely sure of your ground, as very few protests are ever sustained. In the event you could not prove your case, and the protest should go against you and favor the judge, you would lose a great deal more in popularity than you would gain by the protest. Never make a complaint to the judge in the pesence of others. Choose the proper time and place. Do not speak of your disappointments or opinions of his error to others. By no means condemn the judge until you have given him a chance to explain to you. He, too, may have seen something on one or the other of the birds which you have overlooked. Always remember that the judge passes upon the birds as he finds them in the coop, and cannot take into consideration the different appearance of the fowls at your home or at the time they are placed in the coop. For instance, the comb on your bird may have become heated and slightly turned; something may have frightened the bird; he may appear unnatural in front of so many visitors; or he may lift his tail a little higher than usual. You still have the bird fixed in your mind as you were accustomed to seeing him each day at home.

Never talk to a judge while he is working on a variety. Wait until he is through, not only with your variety, but with all of his judging, and even then you should never direct a rapid fire of questions at the judge. Some judges haven't the ability to keep their minds on several things at a time and should you interfere with their work by asking them questions or talking to them in an unfriendly manner while they are judging, their thoughts are taken from their work and they are more apt to make mistakes. Some of these mistakes may work against your own fowls. Some judges are, simply because of habit and physical make-up, more pleasant and more apt to be obliging than others.

Some judges show a greater interest in answering questions and helping breeders with their problems than do others. That is all in the make-up of the judge. The fact that the judge is rather blunt in his replies, does not mean that in his heart he is not just as friendly towards you and your birds as any other person. However, the courteous, obliging and level minded judge is of great value to the average show. You should use your influence in getting such judges on in shows where you will exhibit.

Be a good fellow, a cheerful loser, a joyous winner, and remember that all the birds cannot win, neither can everyone have birds among the winners. Somebody must lose. Look over the defects in your own birds. Be as critical in examination of them as you are in the examination of those owned by your competitors.

Bear in mind that the judge sees your bird for a very short time, more than likely only once or twice through the process of judging. Against that you have spent much time in your yard and training room, examining your specimens, considering their good points and their defects. You must not expect the judge to form impressions in a minute which you have been forming for months. A judge cannot sit down and study over a bird as you have in the weeks and months gone by, because several others must receive his attention that day or the next.

In solid colored birds where foreign color disqualifies, such as in black and white fowls, added care must be taken not to break any main wing or main tail feathers, for birds of these solid colored varieties having broken wing and tail feathers are discounted a great deal more for this than are parti-colored birds, such as Barred Rocks and Silver Wyandottes. Regardless of color, it is poor business to have main wing and main tail feathers broken, as this is usually the result of causes which should have been prevented. Your coops and the doors to your training coops should both be large enough so that you are able to remove your fowls and handle them in such a manner that there will be no excuse for broken wing or tail feathers. Any small feathers throughout the neck, back, saddle, breast and other sections which are broken should be plucked.

No half-way business in the art of conditioning the birds for the show room will prove at all satisfactory. Unless you are determined to thoroughly condition your fowls, thoroughly wash them, and thoroughly clean their legs and toes, it would be far better for yourself, the show. and the Standard Bred Poultry Industry for your birds to be left at home. Bunglesome jobs in preparing birds for the show room are certainly worse than none at all.

We have seen combs and legs on birds in show rooms which were smeared with vaseline in which the dust and dirt had settled. The plumage on the birds were half washed and the dirt not entirely removed; the soap was not rinsed out and the feathers were gummy and sticky. Such birds are far worse in appearance than if nothing had been done to them whatsoever.

Never make the mistake of sending a bird to the show room that is not strong physically, for remember that the trip to the show and confinement in the coop will more than likely aggravate the physical condition of the bird and it will seldom, if ever, win a prize. Besides, you take a great risk of losing the bird and its future use.

In contemplating an exhibit at any show, remember that the rules were printed in the premium list to be read and followed. A strict enforcement of the rules by the average association is absolutely necessary for the good of the show. Unless you intend to abide by those rules, do not enter at the show. Regardless of whether or not fellow exhibitors abide by the rules, you should do so. Set a good example yourself of living strictly up to the rules. Get your entry blanks made out and into the hands of the secretary as early before the closing date as possible. Never make the mistake of failing to put the leg band numbers on your entry blanks.

Many breeders, who are in the habit of going to the show with their birds, and especially if it is a uniformly cooped show, plan on cooping or assisting in cooping their own birds, and, for this reason, believe it is not necessary to put leg bands on their birds until after they are in the show room. This is wrong. The leg bands are used by the secretary of the show for record purposes, other than for the correct cooping in and cooping out of the birds.

In any score card show, you must not expect to examine or handle the score card until they have been officially added up and signed by the judge and recorded in the book of the secretary, and until after all special prizes are figured out and awarded.

It may appear to you that you have a long time to wait before getting possession of your score cards, but remember there are many other exhibitors just as much interested and anxious as you are. You would be throwing yourself open to criticism and suspicion if you should handle the score cards before the proper records have been made from them.

Regardless of how much care is taken by the management of a poultry show, things will go wrong. Unfortunately, it seems as though no one is perfect. Therefore, you should try to help. Put your shoulder to the wheel. Do not complain of the methods when the officers are doing the best they know how. As a general rule almost everyone has more work than he can do at the average poultry show.

Join any poultry shows in your territory whose membership is open to the public and become an active worker. Do not shrink from duty at exhibitions. Attend the meetings. Don't stay away, and then criticize the actions of those who are bearing the burdens. Push! Pull! Lift! Have a voice in the affairs of the organization, but have it at the meeting. Even then there is a proper time and place for remarks on any subject.

FITTING BANTAMS FOR EXHIBITION

Chapter 14

Naturally enough, like men of small stature, we find that the tempers of Bantams vary to a considerable extent. The heavier breeds among the Bantams, such as the Cochins and Brahmas, give little or no trouble as far as their dispositions are concerned. On the other hand,

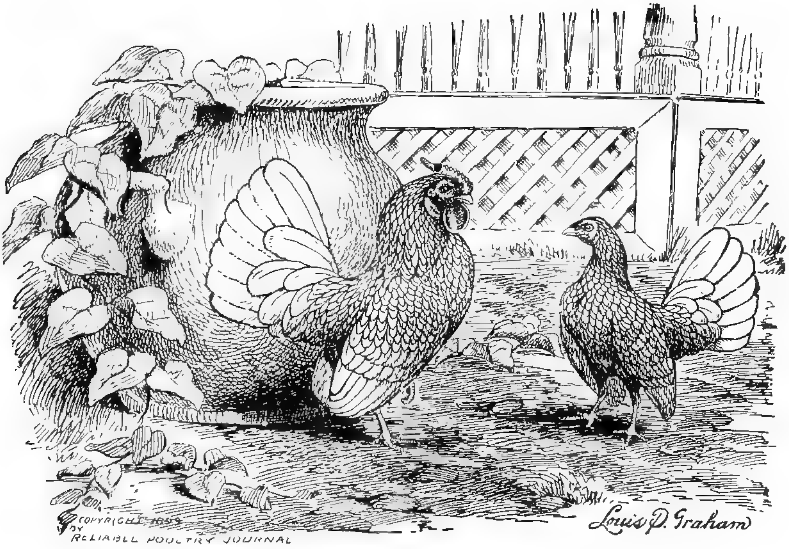

COPYRIGHT 1899 BY RELIABLE POULTRY JOURNAL
Louis P. Graham

Fig. 23.

A pair of Silver Sebright Bantams.

we find a great deal of temper and high life displayed in the case of Games, Rose Combs, Sebrights, and the like; so much so that individual birds defy all efforts on the part of their owners to teach them to become steady and docile in the training coops.

The best thing for these active light weight fowls, and especially those individuals showing more temper than others, is a preliminary lesson through the medium of a good bath at least two to three weeks before an exhibition. Nothing seems to so tame and take the wild life out of a fowl, especially a Bantam, as a thorough washing.

It matters not whether the bird be white or some color, a good bathing will tame the wildest bird. It is not necessary to use soap or to be as thorough in the matter of trying to clean the fowl as would be the case if it were a white bird being washed, but a thorough washing in warm and cold water and a slow drying seem to accomplish the taming desired. Generally, especially in dark colored fowls, the plumage will lose a certain amount of its luster through the process of washing, but that will be renewed again before the show by proper feeding and polishing or rubbing of the plumage.

Competition in good shows is generally so close that condition and training plays a big part in awarding prizes on Bantams. Bantams should be more carefully trained for exhibition than poultry of other breeds; in fact, they will stand more confinement, more intensive work along this line, than will the fowls of which they are miniatures.

Coops used for the final training of Bantams should be similar to those seen at poultry shows. They should be arranged in a light and airy room or outbuilding. When first catching your Bantams and placing them in training coops, it is better to do it at night. They will behave better the following day and they can be put in their coops with less excitement. Futhermore, it is really surprising how much these active, nervous little fellows will stand in artificial light as against the natural day light.

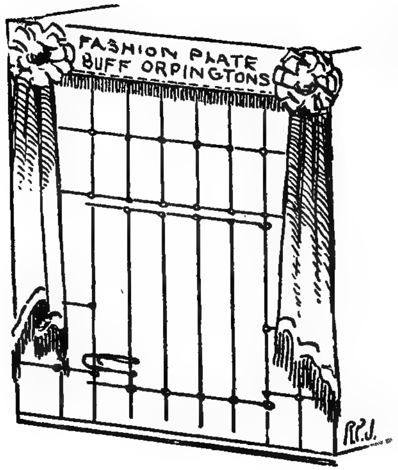
In training your Bantams, your principal work should be to tame them. In the case of Game Bantams, remember they should have a tall, long reach. Every time you come near their training cages, have a little something for them to eat. A small pinch of ground raw meat is relished by them and makes them appreciate your companionship, but always hold it high for that breed. Make them reach for it.

Feather legged Bantams should be bedded only on sawdust. Their quarters should be kept scrupulously clean. Droppings should always be taken up every day. In this manner, you will preserve their foot feathering and the chances of your success in making a winning is greatly improved.

SHOW ROOM ADVERTISING

Chapter 15

In order that an exhibitor may get the best possible results from the money he has spent in preparing his birds, placing them in the show room, and making a winning, he must be on the job. First of all, he should prepare some printed cards for advertising purposes. Some time before the show it is advisable to have printed or painted some cards about 18 inches long by 3½ inches wide. Only a few words in fairly large type should be used in the printing of these cards. These are known as coop cards and can be tied at the top of the exhibition coop or slipped through the wires of the front without covering too much



space, as shown in figure 27. Something like the following is a very good wording for the average coop card:

**FIRST RHODE ISLAND RED
COCKEREL**

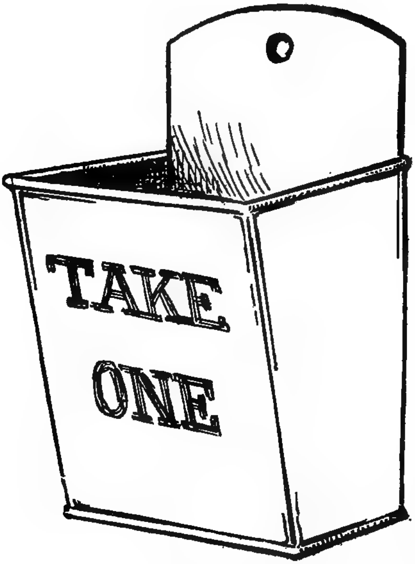
Bred and Owned by

M. J. Jones, Smithville, Mo.

**Another sample shown below reads
something like this:**

**BARRED PLYMOUTH ROCKS,
Winners and Layers,
Bred and Owned by
Charles Johnson, Jamesville, Ill.**

It does not cost much to print these cards , and in the event you have a good show string it is desirable to have some cards like the former, but you should have a full set printed. One for each prize offered in the classes in which you are competing, and some with simply the name of the breed or variety and your address, in case some of the fowls do not get ribbons at all. In the event you have some which do not fit the awards your birds have won you can preserve them for use in some other exhibition. It is really desirable to label every cage containing your birds for the advertising derived, as well as for the information of strangers and visitors in the show room. Never have cards or advertising of any character printed without using your complete address on them.



In addition to coop cards, it is advisable to have some neat business cards to give out to visitors. For these, it is a good idea to have a small tin receptacle made, similar to the one shown in the figure above. These can hang on your exhibition cages. You will be surprised how these cards will disappear from it, and very often good sales are the result.

Suggestions for Practice

1. Put all birds which you propose to exhibit in exhibition cages about one to two weeks previous to the date of the show. Visit the coops often. Take a judging stick and point it through the cage and get the birds to pose for you. Remove them from their cages. Handle them gently. Tame your birds so they will handle to the best advantage while being passed on by the judge. Make them feel that you are their friend.

2. Try moulting some of your birds by pulling the main tail and wing feathers about two months previous to a show, if it comes on an early date and the bird is showing no signs of moult. Be careful not to injure any feathers. It is a good idea to starve the bird by limiting its feed largely to green food and water for two weeks before you attempt to pull the feathers. That takes the fat out of the skin and the feathers die down to some extent.

3. If you have never exhibited any birds, fit and condition a few according to the instructions in this lesson. It will pay you to do this. If you don't win the first time, be a true sport and don't blame the judge or become discouraged.

QUESTIONS ON FITTING AND EXHIBITING STANDARD-BRED POULTRY

Lesson No. 35

1. Name two distinct branches of the business generally engaged in.
2. If your fowls are to be exhibited to the best advantage, what features should be included in the show room?
3. What is the object in exhibiting your fowls?
4. How long does a winning made at an exhibition continue to benefit an exhibitor?
5. What forms a foundation for the production of exhibition quality in any fowl?
6. Mention some of the advantages gained from exhibiting.
7. Name four important things which must be taken into consideration in selecting a bird for exhibition.
8. If you wish to produce an early moult, how can this be hurried to some extent?
9. How should you feed to increase weight and add lustre to plumage?
10. Name three important things to be done in training and fitting birds for the show room.

QUESTIONS ON FITTING AND EXHIBITING STANDARD-BRED POULTRY

Lesson No. 36

1. Mention three important things which must be done in properly washing and drying a bird.
2. What care should be exercised in shipping exhibition fowls?
3. Why is it often advisable to transfer leg-bands and switch birds after they have reached the show room?
4. How can you brighten the color of comb, face and wattles?
5. What method may be used to remove foreign color from beaks?
6. What can be done in some cases to improve shape of back and tail?
7. How can you improve the breast shape or height of birds thus defective?
8. How should an exhibition bird be handled in removing same from a coop?
9. What attitude should an exhibitor maintain toward the judge and show management?
10. What advertising may an exhibitor do in the show room which might prove profitable?

INDEX

Page
Advantage Gained From Exhibiting 7
Advice to Exhibitors 56
Birds Lacking in breast Shape 56
Brightening Color of Comb, Face and Wattles 52
Cause of Large Beefy Combs 53
Coloring Yellow Legs 54
Crooked Toes 12
Defective Combs 11
Diarrhea Prevention 55
Drying Coop 40
Drying Room 48
Feeding During the Moult 17
Feeding to Effect Color of Plumage 25
Feeding to Increase Weight and Lustre 24
Fitting and Conditioning Room 33
Fitting Bantams 59
Foreign Color Removed From Beaks 53
Hammock for Conditioning 31
Ideal Carriage 20
Improving Back and Tail Shape 54
Improving Rose Combs 56
Introduction 1
Knock-Kneed Fowl 11
Leg Weakness 54
Moulting and Conditioning Coops 16
Nomenclature 9
Preparing Fowls for Shipment 49
Preventing Colds 55
Preventing Tail Plumage From Becoming Spoiled 55
Producing Exhibition Quality 6
Proper Method of Handling 55
Removing Foreign Color From Feathers 55
Removing Stubs From Legs 54
Reviving Birds Which Have Fainted 55
Selecting Fowls for Exhibition 9
Shipping Coops 50
Show Management 4
Show Organization 6
Show Room Advertising 60
Slipped Wing 13
Squirrel Tail 12
Stopping Flow of Blood 56
Straightening Lopped Combs 53
Switching Birds and Leg Bands 51
The Exhibition 2
Training and Fitting Fowls for Exhibition 28
Treatment of Ear-Lobes to Improve Color 53
Tricks in Exhibiting Poultry 51
Washing Fowls for Exhibition 37
Wry Tail 10

Poultry Clubs and Organizations

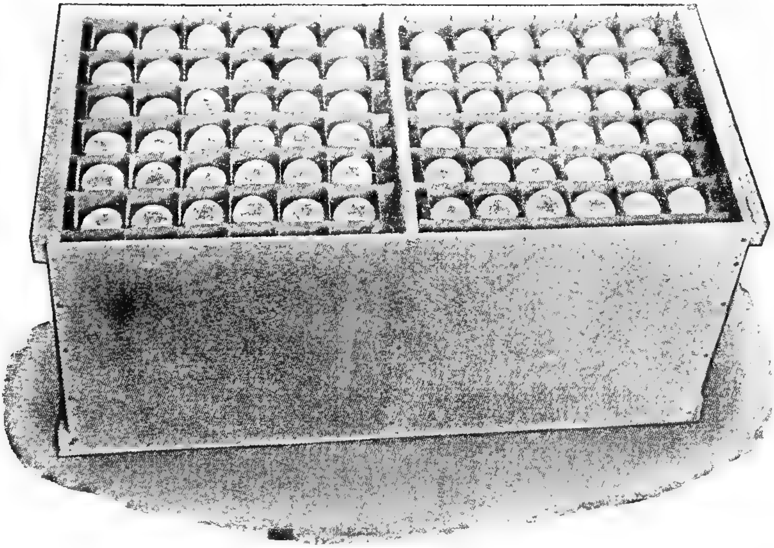
By T. E. Quisenberry, Copyrighted, 1921.

American Poultry School.

There has been a wonderful growth of the club and co-operative idea throughout the U. S. These various clubs are having a great influence in increasing the production of farm crops per acre, teaching the necessity of saving much of the stuff that has heretofore gone to waste on the farm, spreading a knowledge of more scientific production of beef cattle and hogs, and, in many instances, stimulating poultry production and teaching better methods of marketing.

This lesson will treat more especially with the marketing and exhibition side of poultry products. If farmers and poultrymen throughout the country can get more lucrative prices there will be greater interest in the production side of the poultry industry.

Better organization work would mean a tremendous growth of the poultry industry. There is no business that does not thrive when it has been thoroughly organized and a well defined system introduced.



Use honest methods and co-operate with the poultrymen in your neighborhood so that a high quality product may be produced and command the highest prices.

ORGANIZATION, THE POULTRYMAN'S ONLY HOPE.

In a conversation with one of the brightest and keenest of egg farmers, whose accounts are thoroughly systematized, this startling fact stood out prominently: That his lowest cost of egg production was 20¼ cents, and the highest 22½ cents for the past year, the cost of labor and feed being responsible. In the course of our conversation he remarked, "I am getting tired going to the mill and paying what they ask for feed and shipping my eggs to New York City and taking what they see fit to pay me. The millers are all organized and they have but one price, and you pay the price or you do not get the feed; the egg farmers have no organization and the result is that they are compelled to accept what the other man is willing to pay." He took the stand that so long as such things are allowed to continue it is absolutely impossible for the egg farmer to produce eggs at a profit.

The writer is intensely interested in the commercial side of this great industry and he took away with him from the above mentioned farm a lot of food for reflection. We all know what organization has done for the great steel, oil, coal and like industries but it is our purpose to confine ourselves to agricultural interests of which egg farming is a part.

We know that the raisin growers of California made a ten-fold increase in the demand for their product by organizing, raising funds, and advertising the merits of the raisins as a food product. We also know that the orange growers have done likewise, much to their financial advantage, and today one can scarcely pick up a popular magazine without seeing the advertisement of the raisin grower and orange grower of California. Coming a bit nearer home we find that recently the dairy interests have organized, under the name of the National Dairy Council, for the same purpose, namely, to make a broader and better market for milk and its products by educating the public through advertising. Thus far the organizations affiliated with the National Dairy Council represent 250,000 members who are also members of the Council. Their contributions for the purpose of advertising and otherwise promoting the consumption of dairy foods now amount to $8,000 a month for 36 months. This is not the biggest, but it is the broadest advertising campaign ever undertaken. If it is successful, and there is no reason why it may not attain some measure of success, it will benefit more producers than any other promotion ever attempted. Its possibilities are tremendous, and its benefits will be shared by all branches of the great industry which is based on the cow. Whether the advertising campaign is successful or otherwise, one great thing has already been achieved—the getting of 250,000 representatives of the dairy industry into one organization. That should be potent in legislation whenever and wherever organized effort is needed.

There is no question but what the egg farmers need legislation above everything else, and this is especially true of legislation on cold storage, but it should be more liberal rather than more drastic. Let us look for a moment at the storage egg history. During the spring season about three years ago, large quantities of eggs went into cold storage at an extreme range of 18@23c a dozen, the bulk at 20@22c. Some of them came out in October at 24½@26c, in November at 22¼@24½c, in December at 24@25½c, in January at 18@20c, and the season wound up with the lowest prices of the year—16@22c, mainly 16@20c. It will be seen that some of the eggs bought at inside prices that spring and sold the following fall made a moderate profit, and that others must have cost their owners a heavy loss, particularly those which were held longest and sold at the lowest figures. Those who are asking for legislation imposing further restrictions and additional costs on the cold storage industry should study facts instead of the fiction which is so widely and carelessly circulated.

What has been the condition of the regular egg markets of three large cities? We find on certain years that the high price for firsts in the Boston market was 40 cents and the lowest price 20 cents; the average price for the year was 28 and one-third cents. In Washington, D. C., the high price was 36 cents, the low price 19 cents, and the average 22 and one-third cents. In New York City, high price, 36 cents, low price, 19c, and the average 25 and three-fourths cents. When you consider the fact that these prices were for firsts and that a fair percentage of the eggs shipped into these markets will not grade first, the cost of transportation and commission, it is not at all difficult to see that so long as such things are allowed to continue, it is absolutely impossible for the egg farmer to produce eggs at a profit.

According to the Thirteenth U. S. Census, the average selling price of eggs throughout the towns of the United States a few years ago was 19.5 per dozen.

I know the question will be raised, "Why not sell direct to the consumer?" In some instances this is possible, but in the majority of instances the only outlet the farmer has is the regular commission market when eggs are bringing the top cent, and the cold storage plant when they are bringing the lowest cent, with the possibility of a demand for cold storage eggs at good prices when nearby fresh eggs are scarce and commanding top prices. How well this has worked out for both classes is clearly proven by the above.

We followed with much interest the Amrican Poultry Journal's contest for the best articles on the "Net cost of a dozen eggs." Dr. Wood says that for the past five years he figures it has cost him from 24 to 29 cents a dozen to produce eggs and place them on the market.

Now that we are convinced, how are we going to remedy it? Can it be done by co-operation? We believe that organization is possible. We believe that if thoroughly organized it would revolutionize egg farming in America. If the dairymen in the United States can get together 250,000 representatives of the dairy industry into one organization, it clearly proves that we are weaklings.

There are more people engaged in raising poultry today than in the production of milk and cream and the making of butter. There is more money invested in poultry than in dairy herds. There is a greater revenue yearly from poultry and poultry products than from the dairy and dairy products. If this is true, why is it that the utility poultry interests are jogging along in the old stage-coach while the dairy interests are whizzing past in a 60-horsepower automobile; and they are not only now whizzing past with 60-horsepower, but, with the plans mapped out and executed, in a comparatively short time the horsepower will be increased to 80.

Mr. Egg Farmer, you should be vitally interested in this subject.

WHY CO-OPERATE?

"The highest efficiency comes through co-operation. The big work of the world is done by co-operation. Tunnelling the mountains, digging canals, building cities can never be done by the individual. The individual is only a cog in the economic machinery of the world. Alone, the individual has little force, but united with a definite purpose, order and system spring from chaos. It is only by joining our energies with our fellow men that big movements are possible. It is absolutely impossible to attain the highest independence alone. We need our neighbors; we need our social life; we need the economic division of labor; and above all, we need the strong co-operation of our fellow poultrymen who are all producing the same thing. We must realize here and now that the poultry producers will never reach the highest market efficiency except through co-operation. Every line of production in the United States is more or less organized, and the more thorough the organization the less the economic waste. Without co-operation the citrus growers would have been out of business long ago. The raisin growers are putting a standard product on the market in an efficient way, that makes prosperity.

"The manufacturer of any article names the selling price of that article and it must sell for more than the cost of production or the maker goes out of business. Henry Ford does not turn his machines over to a merchant' exchange for them to gamble with and fix the prices.

"The commercial world is coming to a one-priced system and it will not be long till the price of eggs will not be a gamble running up and down a sliding scale at the whims of a few men. Only a few years ago and there was no fixed price for any article on the market.

"The dealer paid as little as possible and sold for as much as the buyer could be coaxed into paying. I can even remember when we used to come home from the store and talk over the bargains that we had made on goods that were marked so much and we jewed him down to what we were pleased to call the right price. That day is almost over. We buy today and pay the price asked without questioning the honesty of the seller. There is a certain sense of business honor that belongs to the highest type of business man.

"What a jumble of things if all the produce were sold through a merchants' exchange! The man that produces the goods should be able to dictate the price, and so he does, in most productions. What an absurd thing it is that the men who produce the eggs have not the least power to fix the selling price of these eggs. Is it not the height of folly for eggs to soar to 60c or 75c at a certain season of the year, thus being unjust to the consumer, and then have them drop below cost of production at the season of the year when the producer might make some profit, thus being unjust to the producer? Under the existing system there is an injustice to both consumer and producer.

"We are producers of eggs. We know how much it costs to produce them. Do we know that we will be able to sell them at a profit? Is there any way by which we can say what we can afford to take for our eggs and give them to the consumer accordingly? One of the largest bankers and financiers of San Francisco says that we have absolute control of our own produce if we will only **get together.**

"This is our problem—**getting together.** We are all so busy producing our eggs that we seem to have little time to put much thought on plans of co-operation. Some of us are afraid that we will not help matters, and might make them worse. Some of us hate to give up that little private trade we have been working years to build up. Why, bless you, don't you realize that even your private trade prices are governed by the **daily quotations?** Our great question is, what power will bring all the poultry men into this Poultry Producers' Associattion?

AUTO TRUCK TO COLLECT EGGS.

"Every poultryman realizes that we should get together. He knows this, but the task rather staggers him and he does not have confidence that makes for the strongest co-operatioon. Now, what one thing would make you, my fellow poultryman, join this association? Here is my own private opinion: If, on a certain day an auto truck would pull alongside of my egg room, load on all my eggs and give me due credit for same, and if I knew that on that same day next week and the week after the same truck would call in, and that I would form the habit of looking for the truck with the big letters, "POULTRY PRODUCERS' ASSOCIATION," do you think that I would trouble myself to try to sell my own eggs? Instead of you and I and all the poultrymen losing time to deliver our eggs, one truck for the purpose would make the rounds. What a saving in time and energy! This comes home to every rancher. If some ranchers lived off the truck route it would be a small matter for each neighborhood to have a central collecting place.

"This would enable all the farmers who raise only a few hens to co-operate also, and join in the work of making a fresh standard product. An instructor would go into each neighborhood and give directions for grading and packing the eggs so that they would be absolutely reliable. The system would be so perfect that any unreliable shipper could instantly be located.

"When this truck with the big letters, "Poultry Producers, Inc." had made its rounds, where would it take its load of eggs and live poultry? It has reached the producers directly, and there is not a producer along the line who will stand back and haul his own eggs to town. The eggs being on our own truck, it behooves us to have a place to drive to in order to begin proper distribution. We must have a central packing house in each district. This branch packing house should be modern and up-to-date. It should have cold storage room enough to hold at least what cold storage eggs are needed for home consumption. It is absurd to have eggs shipped from a producing point to cold storage and then during the season of low productioon have them shipped back again for consumption. What a loss in time and freight each way, which makes a poorer quality. We should get our eggs into cold storage from the nest with the least possible delay and thus insure a better product.

COST AND BENEFITS OF COLD STORAGE PLANTS

"What would it cost to put up a cold storage plant? I have approximate figures from one who installs cold storage plants. He says that a plant will cost in the neighbrohood of one dollar per case of eggs stored. For example, a plant for ten thousand cases would cost ten thousand dollars. The larger the plant, the less per case. If this plant could put out a by-product of ice it might be able to make operating expenses. Otherwise, the operating expenses during the period of storage would not be more than one-fourth cent per dozen. Some say six cents per case.

"I have tried to get exact information as to the total cost of storing eggs. Members of the merchants' exchange say that it costs six cents per dozen to store eggs. For example, if they pay 21c, they must sell for 27c to come out even. At 28c they would make 1c per dozen. A private commission man says that it costs him four cents per dozen to store eggs, and that buying for 21c and selling for 28c leaves him a profit of 3c per dozen. A cold storage man says that eggs can be stored for 2c per dozen and that this covers operating expenses, interest on total investment, loss in eggs, etc. If this price of 2c per dozen is correct, there is a large margin of profit in cold storage eggs.

"Suppose that a district would erect a cold storage plant for ten thousand cases. This would accommodate one hundred poultrymen with an output of one hundred cases each during the four months of cold storage period. Suppose this was erected at a cost of $10,000. Suppose that these eggs were stored at 21c per dozen. This year storage eggs were contracted for at 28c. If these ten thousand cases were sold for 28c per dozen and it cost 2c per dozen for storage, this would leave a profit of 5c per dozen or $1.50 per case, or $15,000 for the 10,000 cases. This would give $150 each to 100 poultrymen for the storage period. This $15,000 left each year in your home community would be worth while, and would be pretty good for a ten thousand dollar investment.

"What would be the advantage of the local cold storage plant? First, it would save freight rates both ways to the city on all cold storage products for home consumption. Second, it would be cheaper to erect a cold storge plant outside the city where property is less. Third, eggs would reach storage fresher and be of better quality. Fourth, and not the least, it would leave your money right at home, where it is earned and where it belongs.

"It would also be possible and feasible to have a grain warehouse in conjunction with this packing plant, where feeds could be delivered direct to the poultrymen at the bare cost of handling.

"This scheme brings the problem home to each rancher and it is, perhaps, the only way to get down to possibilities. When the locals are so organzed, it will be a simple matter for all the locals to get together and arrange the central clearing house, which would receive all the overflow from each district.

"How shall we finance this enterprise? It would be a simple matter after the equipment is installed, for the banks will loan as high as 80 per cent on cold storage eggs and this would carry us over the spring months. How shall we raise the money to build our plant? There are two ways. The first way would be to approximate how many eggs each individual would place in storage for the year, this being done from the number of hens, and have him advance one dollar for each case stored After canvassing the district and approximating how many cases would go into cold storage for the season and collecting a dollar advance on each case, we would have the necessary capital to erect the plant.

"If this could not be done, several poultrymen, whose means justified it, could go to the bank and get a loan to erect the plant, going security. This, perhaps, would be the more difficult.

"The other plan, and one indorsed by several strong poultrymen, is that the Association get some representative to handle the Association's produce in the city, acting as our agent. The one cent per dozen accruing to the Association by our contract agreement will give the Association something like one hundred thousand dollars at the end of the year. This would give us a financial rating that would enable us to borrow money and do our selling direct to retailers.

'Then the problem would be as to how this capital should be divided in each district and all the necessary detatils worked out. This, perhaps, is the most feasible plan, for we could not hope to get equipment ready for business at once. This should not hinder any local district from going ahead and building its own storage plant as soon as possible, for it will be just as easy to ship storage eggs to the city as not. I believe each local district will have its own problem to solve, and the sooner this is done the better. All surplus could then be sent on to our representative in the city.

"We are trying a big thing, to be sure. Did Phil Armour realize when he was working by day in the stock yards in Chicago that some day he would have a packing house in nearly every large city in the United States? Did Heinz realize when he was canning pickles in that old shack that some day he would have canneries in every State in the Union, and that his 57 varieties would find the way to the dining tables of the world? Fellow poultrymen, we must get together and standardize our product and sell it ourselves, eliminating as much lost motion as possible between producer and consumer. Co-operation will eliminate lost motion, take up the 'economic slack,' and put egg-farming on a staple basis."

MARKETING THROUGH SCHOOLS.

The marketing of poultry products through the rural school would lay the foundation for the better marketing of everything produced on the farm.

Many rural communities throughout the country are moving the scattered one-room school houses to a central place, building school houses that will accommodate several grades, and teaching such subjects that will fit for rural living rather than for life in towns and cities.

In many cases wagons collect the children and hault them to school. The wagon can be utilized to carry the eggs to the institution twice a week during the school term. A dark room can be made for candling the eggs. A trade can be secured that will handle certified eggs. In counties where this plan has been tried there are many families that clothe their children and pay their schooling expenses by the sale of eggs.

Prof. J. K. Morrison, an assistant instructor of this school, was requested by Dr. A. P. Bourand, Secretary of the Southern Education Board, to co-operate with the rural school supervisor of Mississippi to demonstrate the possibilities of this work in a few school centers. Rural Hill was the first school to be organized under this plan. This organization made good and there were times when eggs were selling at 13 cents locally when they were getting 25 cents.

If this plan can be started during the school session it will be possible for the Circle to co-operate in paying the expense of some boy to drive a team in order to collect the produce during the vacation. The cost of getting the eggs to market during the school year will amount to nothing and be a great stimulation to every boy and girl in the more intelligent handling of every farm product.

Farmers do not use the methods of big business. They know little of the art of standardization. They buy everything they use under a brand name. The brand under which they sell is "farm stuff," which immediately discounts the price, as buyers know of the prevailing carelessness of the average farmer. All must be punished who do not enter organizations and establish a name for themselves. There must be a separation of the particular farmer from the careless and indifferent kind. Organization is the keynote that means better prices and the doubling of profits. Organization will bring standardization which is a guarantee of better prices.

Many students of the A. P. S. should become leaders in this work. The crying need of every rural community is leadership. With your superior knowledge you should be able to make the organization work go. By this means you become a benefactor and you can increase the prices of your own products.

It is much better, even though they are shipped in dozen cartons, to allow the eggs to remain open so that the agent who handles the eggs can handle them. This is certainly necessary in the first stages of this work. The agent can then report back to the leader of the club the offending members. The city agent, and not the customer who buys the eggs, must be the umpire, for, as a rule, if customers purchase bad eggs when they are buying eggs that have a guarantee on them, they just quit purchasing eggs under this brand name. One dissatisfied customer loses trade for the organization, and it is not long before the organization will go to pieces.

Our plan was to have each organization named by letter and each member had a number. We used what is known as the Bingo Egg Stamp. This stamp fitted over the big end of the egg and the name of the organization was printed around the circle: Miss. Co-Operative Poultry Association A-3. A is the letter for the organization, and 3 is the number of the member. In some cases eggs were sold to the consumer, but there is only a limited trade to be found. Only a certain number of cases can be guaranteed, as it is impossible to guarantee as many eggs for a year round trade as are produced in the highest producing season. A number of the eggs must be sold in the general market in the season of heaviest production. This method though will bring better prices for these eggs.

It may be more convenient for an organization to pay the local dealer a cent a dozen for acting as receiver. The method used in the rural school organization work is different from the Johnson County plan. As a rule, groups of farmers do not realize as they should the great importance of never sending a bad egg to the market. They do not realize the great risk of losing the trade for the entire community on account of the carelessness of the individual. For this reason, we prefer that members do not seal the egg on the farm. The risk of losing the trade is too great. The inspector should candle every egg to be sure that every one is sound.

THE ORGANIZATION OF CO-OPERATIVE EGG CIRCLES.

A co-operative egg circle is an organization planned to market eggs frequently and to avoid or save much of the waste incident to present day methods of handling farm eggs. When farmers and farmers' wives group themselves into an organization and can have a regular output of high-class eggs they are enabled to get maximum prices. One man with five dozen eggs is compelled to sell them in the local market, oftentimes by the trade method of exchanging eggs for goods.

The merchant who buys does not know what he is getting. He knows that he has bought something with shells, shells that are sometimes white, sometimes brown, and sometimes a color halfway between. They have some clean eggs, but many are dirty. Under the present system which prevails over the greater part of the country the man who brings in a dozen shells, it matters not what they have in them, gets just the same price as the man who brings in a dozen eggs that would class in the eastern market as "near-by hennerys."

The Circle enables a group of neighbors to separate themeslves from the careless lot and they are no longer dependent on the merchant who insists on buying eggs by the case count method.

Many millions are being lost by careless methods, but there is little hope of much change until a different method of handling poultry products is forced on the average buyer. The people who read certainly know how to reduce this great loss, but they are rather indifferent, because they see no advantage of handling eggs with care if their neighbors persist in their carelessless, and where there is no premium for their extra caution in producing good marketable eggs.

This is a matter of interest not only to the farmers, but to all the breeders of pure-bred stock. Just as soon as the farmer is convinced that uniformity counts, and that he must have pure-bred stock to produce uniform eggs, he will take more interest in buying pure-bred poultry with which to stock his farm.

There has been a time, not very far back, when eggs did not bring one-third as much as they do today, and, too, there was a time in some parts of the grain belt when it was just as cheap to burn corn as it was to buy coal or wood. Grain has gone up in price, and in feeding grain today it must be fed only to pure-bred stock, and the eggs sold at the very highest prices obtainable, if we are to make a profit from poultry.

When enough organizations are formed it is possible to secure as a manager an expert salesman, who will handle all of the products. But it is possible to form these organizations even in a small way and at least double the net profit from eggs and poultry.

There are different methods of handling this work, and after the various plans are given you, it is possible to select the plan that best suits your conditions.

Members must agree to live up to a certain set of rules, which must be rigid in their requirements. It is mighty easy to lose your trade, and it is far easier to get a new customer than to get back one that is dissatisfied. We think that it is necessary that every egg be candled before it leaves the farm. Under the present methods the farms have a man in the city, hired for the purpose, who candles their eggs. Under the present system he pays the freight on the bad eggs hauled to market and for the dray that hauls the bad eggs to the garbage heap.

Prices on eggs are established very much like the prices for life insurance. They are based on the law of average. The insurance men calculate how many men have died each year for the ten years previous and from these tables make their rates.

The commission men base prices on the number of good eggs that reach the market. They know that last year a certain number of eggs that could not be used came to market in May, an increased number in June, still more in July and August, and prices must be based accordingly. So, after all, it is the farmer who must suffer from this negligence, not the commission men.

Your lesson on eggs should enable you to handle the eggs with care, and you already know how to candle eggs to select the bad eggs or those with blood clots. Make you a candling outfit, and if you are a leader in the organization of a home club, teach all of the members how to candle eggs, and see that each member does this with regularity. It will certainly save trouble. If you guess at the eggs you ship, some members will be careless and in spite of warning will use eggs that they should not ship and get the organization into trouble very quickly.

There is a lack of confidence of the city buyer in the farmer, because of the careless methods that are used on the great majority of farms throughout the whole United States, and you start your work, as a rule, against prejudice. Many buyers have the same distrust for the farmer as the farmer has for the commission man . The farmer, in most cases, never stops to consider that there are two sides to this question, He never stops to think just how many counterfeit eggs he places on the market and the methods which have to be used to protect the buying public from his bogus stuff. A man who knowingly sells counterfeit eggs is just as bad at heart as a man who passes a counterfeit dollar in a trading transaction.

There are two methods of detecting the member who is not particular in handling eggs and who is permitting inferior eggs to go to market. One is by using a stamp that will stamp the number of the member and the organization on the end of each egg. Another way is to use stickers to seal up the box, on which are printed whatever matter is desired, so that the egg can be traced back to the member that sold it. The great benefit to be derived from this is that it throws a responsibility on each member and the guilty are culled out. This method forces inspection and it does seem that, knowing this, each member would realize the responsibility, and, even if they are indifferent as to their own welfare, would be careful for the sake of their neighbors, who stand a chance to lose a good trade and be boycotted on account of the carelessness of some one member.

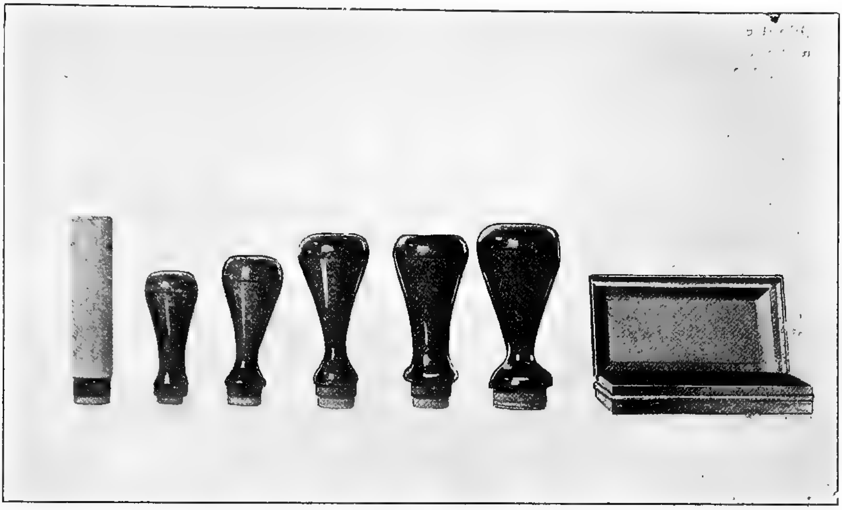


Fig. 4. Various stamps for putting numbers on eggs. The Bingo is one of the best for the purpose. These can be purchased from the "American" Poultry Supply Company of Kansas City.

By this method the eggs are candled, graded and sealed right on the farm, and the responsibility is placed on the individual.

There are various methods of organization. If you are desirous of organizing a circle in your own community, talk up the work with a few of your neighbors and show them the advantages of such an organizattion. Get in touch with the markets that will handle your output so that you will have something definite to place before the meeting at which organization is to be discussed. We believe that it is better to ask only a few people whom you know can be absolutely depended upon. Too many people are willing to hop right in and if they do not see a great big advantage right in the first shipment or two, they are ready to quit and say, "I told you so." Beware of this type and get people who have staying qualities and who are willing to go ahead and work the plan out until you know definitely what there is to it. To you it will be an untried proposition, and you will have much to learn. Ask the dealer to whom you send your eggs, when the first shipment is made, to criticise the shipment severely and let you know just where and in what way you can improve same. One of the greatest drawbacks in handling farmers in this way, right at first, is that so many have mongrel fowls that do not produce uniform eggs. It would be well to begin to agitate the improvement of the flocks right from the very start.

You can address the audience briefly, telling them just how advantageous such a system would be, and then throw the matter open to discussion. A vote should then be taken, and in this way you could find if enough people are interested to form such an organizattion.

Next, elect your officers and discuss the best method of handling these eggs. In most cases, a receiver must be appointed. If no member is conveniently situated to handle the eggs and look after the shipment the local merchant will have to be depended on to do this part of the work. Thirty cents a case is a reasonable amount to give someone to handle the eggs.

If the merchant or the member who receives the eggs does not desire to pay until returns are made, which will generally be necessary, it would be well to use a duplicate book such as merchants often use. This should contain two sheets of different colors, white and pink can be used, or any two colors which you want. A carbon is necessary, so that both copies are made at one time. The receiver gives the white sheet, showing the date and the number of eggs brought, to the member. The receiver can keep the other copy for his own files, to guide him in making the payment. The member brings these tickets at the end of each month and a settlement is made just as soon as the books are balanced and it is found just how much has been received for all eggs sold.

A membership fee should be collected in order to buy supplies. The individual cartons must be purchased, stamps and a number of egg cases must be acquired. After the organization is well started and success is assured it would pay to buy in quantities. This would be quite a saving. We suggest that the membership fee be not more than a dollar, and if money is needed for various expenses each individual member should be assessed.

A board of directors of five members should be elected at this meeting. A president, vice-president and secretary can be selected at the first meeting of the board.

The tendency of the times is toward forming new organizations rather than using organizations already in existence. In many communities it is possible to co-operate with some organization already in existence. Home makers' clubs are being organized in many communities throughout the country. Many times this work could be handled by this organization, and at least one week each month be given to the study of poultry. It would give variety to the routine work of this organization and help to increase the earning power of the members.

It is often possible to co-operate with a creamery organization and have the eggs handled through the creamery. The wagons that collect the cream can collect the eggs and there would be very little increase in the expense of handling the eggs.

Fig. 5. Officers of a Canadian co-operative egg circle.

Great care should be exercised in the selection of the manager, as much depends upon his hustling qualities in securing a trade and in encouraging each member to come across with a high-grade product. The board will largely be responsible for the membership and should always be careful of the type of people taken in.

Some folks are a little greedy and want all the benefits that accrue from organization, but are willing to make none of the sacrifices in order to build up and keep the trade.

It is possibles to make the pay of the manager depend on the number of eggs handled and the price received above market quotations, so that there will be an incentive to him to increase both the business and the price.

There is no country in the world where the business men are better organized for the carrying-on of business. By centralization of capital, big corporations have been formed, which, regardless of some of the abuses that have arisen, are the most efficient in the world. There has been a great struggle to get the farmers of the country to realize the great benefits of closer co-operation. Many organizations have been formed with a view of bettering rural conditions by increasing the selling power of various farm products. Many have failed, yet we have fine examples of organizations that have revolutionized many industries. Notable among these organizations is the Fruit Growers Exchange of California. By thorough organization and the employment of expert managers that enables them to compete with other organizations that use the selling methods of big businesses they have made fruit growing profitable. Such organizations use a great amount of space in advertising their products and by having attractive brands, they increase the use of fruits and are enabled, by better selling methods, to eliminate waste and, by proper grading and packing, manage to sell all of their fruit that is at all salable.

The work of organizing individual associations for the marketing of poultry products is in progress in a few States. The aim of the organizers in every State should be to form a large number of Egg Circles, adopt a brand that will insure uniformity and federate all of the circles into one State-wide organization. It is possible to form district organizations, which can handle the problems of the organizations of the district, and they in turn can have a state-wide federation and control the marketing policies for the State organization. This is the method that is used in the Citrus organizations of California, and it is also in use in old countries where the organization work has reached its highest development.

A state-wide organization is made up of the local associations and should have as its chief aim co-operation. They unite with a common agreement as to policies. As a rule, it is better in forming such organiations not to make the stock feature too prominent. They may even be formed without capital stock and the organization supported by dues from each organization; or, the expenses of the organization can be raised by charging a percentage on all produce handled, which can go into a common fund and if the money assessed is more than enough to pay expenses it can be passed to a surplus account such as every organization needs.

The people of our country have a great advantage over foreign countries on account of the large amount of money being spent by our government for the welfare of the farming class. If the proper interest is displayed in this organiation work, and if communities petition the agricultural department at Washington, expert help will be given. In many States marketing experts are sent out, also, to aid in organizing and teaching proper methods of handling the products that are for sale. We are dealing more especially with eggs and poultry but such organizations can handle other farm products when they have once thoroughly organized and know the markets, but it is better just at first to confine efforts to poultry and eggs.

This work becomes a very strong educational factor, and when once the farmers of this country realize that they can get what poultry and eggs are worth there will be a greater interest in production. In some of the organization work that is being done at this time they do not find that it pays to keep up co-operative marketing during the season of scarcity. It will not take long to convince farmers that it will pay to feed and breed right in order to keep up a year round trade.

Fancy hennery white eggs or fancy hennery browns can be produced in other sections than the East, and if eggs can be handled in sufficient numbers and marketed often enough they will command premium prices even in the Western markets.

That farm life may be made more attractive there is great need for an increase in the farm income. The quickest possible way to bring about such a result is to increase the selling price of country produce.

You can talk all you please about the middle man, but there is little doubt that he is needed so long as farmers persist in their careless methods of handling country produce. He dumps his eggs on the market and later, after they have passed through many hands and have been candled and graded, they are sold. Farmers' eggs are not in shape to be sold on the market, as they are too untrustworthy. The farmer has to pay the man in the city who grades and candles the eggs and places them in shape to go to the retail trade.

The only way we know of to bring about a change in the present methods and aid communities in getting decent prices is to grade and candle these eggs at home, and if you are not running a large commercial plant, group your eggs with those of your neighbor and find a market that will pay you for eggs on a quality basis.

Most of you know too well the present manner of handling eggs to repeat it here. If we wait until the country merchant improves the price on our poultry products it will be a long time before we can realize bigger profits. His policy is short sighted. If the price of eggs can be increased and the farmers make more money out of their produce he will be benefited, for production will increase and there will be more money to spend. Everybody should share in this general prosperity.

One of the large Minnesota creameries has given a striking illustration of just what it means for the farmers in the northwest to handle their eggs properly and sell them by proper methods. The merchants at first thought that it would injure their trade, but soon found that they were rid of the troublesome job of having to handle the eggs and that by this method of selling them, by proper grading and all being sold by one organization, better prices were obtained and the community became more prosperous.

The merchants of most any place will at first have the same feeling that the merchants of Minnesota had, but when they see the benefits to be derived from the improved methods their opposittion will soon cease. He refuses to buy eggs loss-off because it takes time to candle, and in many cases he hates to offend his customer by telling him that his eggs are not up to standard. The farmer must take the first steps to improve his own condition, and we are hoping that many of you will aid in the work of organization so that the industry will get the impetus that will come from receiving better prices.

During the spring when eggs are plentiful and are being handled often there is not much premium price. The eggs are being handled more rapidly and the climatic conditions are such that the eggs do not deteriorate so rapidly. The wide margin comes during the hot season, when the losses are so great on account of careless handling of the eggs.

The Danish Farmers and Co-operative Egg Export Associatioon was organized in 1895, and in 1909 it included five hundred egg collecting circles with a membership of 43,000 farmers. The farmers have a big central office in Copenhagen and have a number of packing plants located in large cities where eggs are stored when the supply is more than the trade handles. The Danes have methods different from our cold storage. They use large vats which hold a solution that preserves the eggs. This is a secret of their organization and it is not possible to obtain it. In their report of 1910 they showed sales of $1,080,000. They also sell dressed poultry. The object of these organizations is to protect the Danish farmer and give him prestige by the use of a trade mark, and by finding him the best markets and generally reducing the cost of handling poultry products. These organizations ship large quantities of eggs to other countries, and their organization has recognition as the largest cooperative organization in the world which devotes its efforts exclusvely to the handling of poultry products.

The organiation of Egg Circles throughout the great poultry centers would give great impetus to the poultry work and afford a much larger market for breeders of high-class stuff. As soon as farmers begin to see the great value of uniformity they will very quickly be converted to the idea of having pure-bred stock. The trade demands uniformity.

Professional poultrymen everywhere should get behind this work and help to form a general federation of Egg Circles in each state, that the present system in vogue may be abolished forever.

COMMUNITY EGG CIRCLE RECEIPT FORMS—INSTRUCTIONS FOR PRINTING AND BINDING.

Forms A, B, and C should be numbered in triplicate. Form A (original) should be printed on white paper, Form B (duplicate) and Form C (triplicate) on paper of different tints, preferably light bond, and bound in books of 25 numbers to the book. Forms B and C should be perforated.

INSTRUCTIONS FOR USE.

The collector enters the total number of eggs received from a member in the spaces provided on Form A, using carbon sheets so that the date, member's name, circle number, and number of dozen eggs collected are given on all three forms. The collectors, at the time of collection, deliver Form C to the member, which is a receipt for the number of eggs delivered to the collector.

At the end of the day the book containing the original and duplicate copies, Forms A and B, is turned in at the office.

As the eggs are candled and graded the number of dozens of each grade is placed upon Form A by the grader, the same information being shown on the carbon, Form B. This then gives the member the proper credit for the number of dozens of each grade delivered.

Settlement is made for each pool or delivery, which in most cases will be covered by one receipt for each member. As returns for the shipment are received the amount due each member will be carried out in the price and total columns of Forms A and B. Check is then drawn for the amount due and forwarded to the member with Form B, which gives a statement of returns and a duplicate of the receipt which the member holds with the additional information of the grading and amount received for each grade. Form A remains in the book and is kept on file in the office, to serve as a permanent record of settlements with the producer.

FORMS.

(Form A)

Folio________ No________

____ ____ ____ ARCOLA EGG CIRCLE, Arcola, Mo. ____ ____ ____

(Office Copy of Member's Receipt.)

Date, __________________19____

Received of______________________ Circle No.________ the following:

	No.	Price	Total

Paid by Check No_________ Checked by__________________

Date__________________19____ Collector__________________

(Form B)

No________

ARCOLA EGG CIRCLE Arcola, Mo.

Statement of Returns and Copy of Member's Receipt

Date Collected_____________19____

Mr______________ Circle No________, the enclosed Check is in payment for the following:

	No.	Price	Total
Less ________________________________			
Total of Check ________________________			

Checked by __________________

Collector ____________________

Manager _____________________

(Form C)

No__________

ARCOLA EGG CIRCLE, Arcola, Mo.

Member's Receipt.

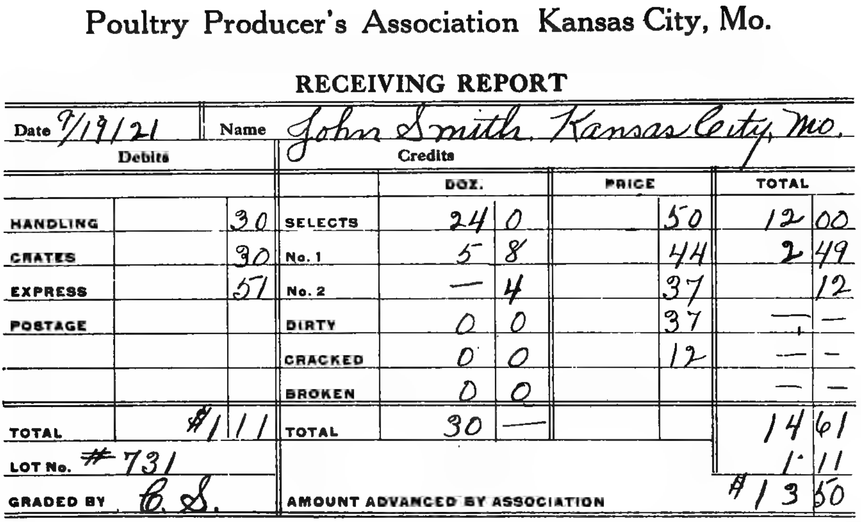
Date__________________19____

Received of______________________ Circle No________ the following:

Collector__________________

To Member: Keep this Receipt and compare with monthly statement sent you by Circle office.

Egg circles should use Standard Egg Cases or Special Cases for assembling the eggs at one central point. Also have a special Trade Mark or Brand for all eggs marketed by your Association.



Poultry Producer's Association Kansas City, Mo.

RECEIVING REPORT

Date 9/19/21 Name John Smith, Kansas City, Mo.

Debits			Credits	DOZ.		PRICE		TOTAL	
HANDLING		30	SELECTS	24	0	—	50	12	00
CRATES		30	No. 1	5	8		44	2	49
EXPRESS		51	No. 2	—	4		37		12
POSTAGE			DIRTY	0	0		37	—	—
			CRACKED	0	0		12	—	—
			BROKEN	0	0			—	—
TOTAL	$1	11	TOTAL	30	—			14	61
LOT No. #731								1	11
GRADED BY C. S.			AMOUNT ADVANCED BY ASSOCIATION					$13	50

The above is the style of report used by the Poultry Producers' Association of Kansas City, Mo. This shows the name of the shipper of one case of 30 dozen eggs. One cent per dozen was deducted for the handling and grading. Thirty cents for the new crate into which the eggs were transferred, and 51 cents paid out for express, making a total deduction of $1.11. In this case there were 24 dozen select eggs which sold for 50 cents per dozen. Five dozen and eight eggs, grading No. 1, which sold for 44 cents per dozen. There were four eggs which graded No. 2 and sold for 37 cents per dozen. The slip shows who graded the eggs. A copy of this slip and record is kept in the main office and a copy sent to the shipper with his check for $13.50. This is a very good form for co-operative marketing associations.

CANADIAN CO-OPERATIVE EGG CIRCLES

Canada has made more progress in solving marketing problems and in organizing Co-operative Egg Circles than any other section of North America. This is partly because of government aid in this direction. This work has been under the direct supervision of Prof. W. A. Brown and he makes the following valuable suggestion:

"A Co-Operative Egg Circle is an association organized among farmers for the purpose of marketing eggs frequently and regularly through a common medium. The object is to improve the quality of eggs as they leave the farm, and to place them in the hands of the consumer with the least possible delay and in the best possible condition.

"It has been estimated that Canadian farmers lose between five and six million dollars annually, as a result of carelessness in handling and marketing eggs. The practice of simply using eggs as a medium of exchange for goods at the local store and of estimating their value by number rather than by quality, has not been conducive to the marketing of a high-class article.

"Some years ago when eggs were worth only one-half or one-third as much per dozen to the farmer as they are today there may have been some excuse for the above system, but today when they represent a big item in the annual receipts from the farm, it is time that an improved method of collection and marketing was adopted.

"It is a well known fact that in our large consuming centers there is an ever growing trade that will pay a decided premium for new-laid eggs of uniform quality. The producer or farmer located near these centers is often able, by personal canvass or by taking advantage of the local market, to obtain the price ordinarily paid by the consumer, but the farmer living at a distance has not this opportunity. The latter has not, usually, a sufficient quantity of eggs nor is his supply constant enough to warrant him going to the trouble and expense of making special shipments.

"A Co-Operative Egg Circle overcomes this difficulty, and obtains for the farmer living at a distance approximately the same premium, less the necessary transportation charges, that the nearby farmer can secure. The eggs are collected at regular and frequent intervals and the association secures the advantages of cheaper transportation through larger quantities of eggs being shipped at one time. The members also derive benefit from the expert salesmanship of a good manager.

"An important phase of the work is the fact that, at the time of joining the association, each member agrees to stamp his eggs with a given number designated by the board of directors. This is done so that the eggs may be identified when graded and payment made according to quality. The stamp also serves as a means whereby the consumer may be able to identify circle eggs when displayed among others.

THE BENEFITS TO BE DERIVED FROM ORGANIZATION

The co-operative marketing of eggs is a strictly business proposition, and the opportunity offered for increased financial gain is undoubtedly the chief incentive to encourage farmers and others to become members.

There is no fixed or recognized premium on new-laid eggs. It depends upon the supply and demand and varies according to the season. In the late summer, fall and winter months the premium should reach its highest point, but in the spring when eggs are being rushed forward with all possible speed, and reach the consumer in much better condition than at other seasons of the year, the premium on circle eggs is not so great. In other words, as the quality of ordinary farm eggs becomes more uncertain the premium placed on new-laid circle eggs increases. It is possible that during the spring of the year prices obtainable by circle members may not greatly exceed those paid by the local store, but for the eggs produced in the months of December and January the premium may amount to as much as 15 cents per dozen. For the eggs produced in the month of December last year, the majority of circles in Ontario and Quebec received from 45 to 55 cents per dozen.

The egg circle movement is of great benefit to the community in the influence it has upon the production of eggs when they are most expensive. It requires patience, skill, good stock and good management to secure eggs in the winter months. Not many farmers have had in the past, however, the incentive to bestir themselves in this direction. But when prices aggregating 50 cents per dozen are obtainable, it places a different aspect on the subject. The result has been that where egg circles have been organized many farmers, who never before paid much attention to their poultry, by giving to their hens the same generous, systematic feeding and treatment given to the other classes of farm stock. have been able to secure a supply of eggs, that in the course of the winter season has amounted to a considerable sum.

Co-operation in the marketing of eggs and poultry has lifted poultry husbandry to a higher plane in the consideration of the farmer. Many farmers in the past have not thought hens were worth bothering about. But when a laying flock assumes the position of being one of the best revenue producers of the farm, it is viewed in a new light. The farmer naturally turns his attention to better poultry, improved methods of housing, more generous and systematic feeding, and becomes much more receptive to all reforms that will tend to improve the production of his flock.

METHODS OF ORGANIZATION

It is customary in districts where considerable interest has been expressed in the co-operative marketing of eggs for a public meeting to be held and the whole matter thoroughly discussed. The general plan followed in such a meeting is to have someone, who is familiar with the subject, give a brief address. The meeting is then thrown open for a general discussion and after all who desire to express their views have spoken, a vote is taken as to whether those present consider a co-operative egg circle a practicable undertaking for that district.

Should the vote be in the affirmative, the first step is the adoption of a constitution and by-laws and the election of a board of directors. The constitution and by-laws used by a number of the circles are given herein. In choosing the board of directors it is customary to select individuals from representative sections of the district surroundng the central shipping point.

It will be noticed that the amount of the membership fee is left blank in the constitution submitted. This should be decided upon at the organization meeting. The amount varies from 25c to $1, depending upon the approximate amount of expense the circle expects to incur at the outset. Twenty-five cents will cover the cost of the stamp and pad, but experience has shown that whenever possible it is well to charge more, owing to other incidental expenses that are bound to arise.

According to the constitution the president and secretary are chosen from the members of the board of directors at the first board meeting following the organization meeting. It is well, therefore, that the board of directors plan to meet as soon as possible. Sometimes this meeting can be arranged immediately following the organization meeting.

In some instances where the egg circle is organized in conjunction with a co-operative creamery, cheese factory, farmers' club, or other association, the board of directors already appointed acts for the egg circle as well. Sometimes, when linked up with other co-operative associations of this kind, the matter of financing the undertaking at the outset is greatly expedited, for the association already having funds of its own, is able to purchase a fuller and more complete equipment of egg cases, candling apparatus and other things that may be deemed necessary. Then, again, when a cream gathering wagon or wagons collecting milk for cheese factories are already covering certain routes, they may be utilized for the collection of eggs as well.

While the directors can do much in the way of interesting new members and in keeping a general supervision over the work of the whole circle, their most important work is in the appointment of a competent manager. The success of the circle depends to a very great extent upon the energy, ability and honesty of the manager employed. He is the person who comes most frequently into contact with the members, and upon his business ability and his shrewdness in selling the eggs to the best possible advantage depends entirely the financial returns made to the members. The constitution provides for the payment of the manager on a salary or commission basis, according to the agreement made with the board of directors. The commission basis is usually adopted, and ranges from one-half to two cents per dozen, depending upon the quantity of eggs offered and the amount of work done by the manager. It has been suggested, however, that the most desirable arrangement would be a sliding scale of payment, according to the quantity of eggs available and the relative prices obtainable at the different seasons of the year. It is claimed that such an arrangement would not only act as an incentive to the manager to secure more eggs but, also, that in his endeavor to secure the highest possible price, he would be more exacting as to the quality of the eggs furnished.

Sometimes it may be difficult for a board of directors to secure a suitable manager, that is, a man who not only has the necessary business ability but who also knows the egg trade, and is capable of candling and grading the eggs received. In several instances this difficulty has been solved by the board of directors calling for tenders for the position of manager for the circle.

DETAILS OF ORGANIZATION

In most circles the eggs from each farm are collected at stated intervals by the manager; in others the members deliver the eggs at some central point, such as a creamery, cheese factory, store or house, from which the manager makes the shipment.

Payment for the eggs is usually made one week in arrears at the price prevailing at the time of collection. The delay of one week, or at the least until the next collection, is necessary so that the eggs may be graded; the bad, the dirty and the small eggs removed and deductions made accordingly. When the circles ship to a wholesale produce firm, the firm is usually willing to supply the circle with cases, but when the circle contemplates shipping to the retail trade, it is usually necessary for them to purchase their own cases and fillers.

The stamps suitable for marking eggs must be specially designed in order that a clear imprint may be secured on the rounded surface of the egg. The die itself usually consists of a double lined circle with appropriate wording, the number of the circle and the number of the member being clearly inscribed within.

The die should be made sufficiently flexible so that when brought into contact with the shall, it will touch all parts at the same time. If the manufacturer has taken the precaution to insert a hollow rubber cushion at least one-quarter of an inch in thickness between the die and the wooden handle the clearness of the imprint will be greatly enhanced.

Some circles in order to properly establish their eggs in a select trade, use the one dozen size carton, on which suitable printing and advertising matter is displayed. Some use a small stamp on their eggs. This is a custom similar to that followed by some of the larger wholesale and retail firms, who from experience have learned that the greatest amount of money to be made in the produce business is the establishment of some special recognized brand of goods.

The one dozen "two by six" carton costs less than one cent when purchased in quantities. It fits conveniently into the average thirty dozen case and forms a very convenient package in which the consumer may carry home a dozen eggs. The consumer, having once proven to his own satisfaction that eggs of this brand are good, naturally inquires for them again. In other words, eggs of quality well established are in themselves the best advertisement for future sale and delivery. One well known firm in a large city advertises regularly in the daily papers a list of the best retail stores at which eggs of their brand may be secured.

The question of financing the purchase of cartons and other items is sometimes a rather difficult problem for an association to solve. The membership fee should be large enough to cover the cost of stamps and pads and other incidental items at the outset and leave a small surplus in the treasury. Often small amounts remain over from the receipts of shipments after the manager has deducted his commission, paid transportation charges and made the most equitable division of the returns possible among the members. This is placed to the credit of the association. Should the amount then not be sufficient and should direct cash contributions not be desirable. it has been suggested that the board of directors be given power to levy upon each member a tax of one-half or one dozen eggs per month at certain times in the year, it being understood that the proceeds from the sales are to be credited to the capital account of the association.

Proposed Constitution and By-Laws of Canadian Egg Circles

Name________________________Egg Circle No__________

Place________________________Adopted _______________

Province ____

CONSTITUTION

Name

1. The name of this association shall be the______________________________________Egg Marketing Association

Objects

2. The objects of the association shall be the increasing of profits to poultry raisers by co-operation. This association shall seek to attain this object by—

(a) Marketing eggs of the best possible quality, and

(b) Selling the eggs delivered by the members at the highest possible prices.

Membership

3. Membership can be obtained by all poultry keepers living in the vicinity of____upon payment of an entrance fee of________________________

Dues

4. The annual dues of the association shall be________________ and shall become due and payable on the first day of January of each and every year.

Officers

5. The officers shall consist of a president, vice-president and secretary-treasurer and four directors.

6. The president and vice-president and secretry-treasurer shall be chosen by the directors from among themselves at the first board meeting after the annual meeting.

7. The directors may select three of their number to act as an executive committee (the president to serve as chairman) to have general charge of the affairs of the association.

8. At the annual meeting two auditors shall be elected.

9. The board of directors shall employ a business manager. The business manager shall not be a member of the board of directors.

Duties of Officers

10. The president shall preside at all meetings. He shall call meetings of the board and members when necessary and shall advise with and render such assistance to the manager as may be in his power. In his absence the vice-president shall have and exercise all rights and powers of the president.

11. The secretary shall keep a record of the proceedings of all meetings and of all receipts and disbursements and report the condition of the finances annually or as often as the directors shall desire. The secretary may, on approval of the board of directors, employ an assistant to help him in his work.

12. When a vacancy shall occur through any cause in any of the offices established by the constitution and by-laws of the association, it shall be filled at the next regular or special meeting of the board of directors.

13. Four members of the board of directors present and voting shall constitute a quorum for the transaction of business.

Meetings

14. The annual meeting of the association shall be held in the month of January of each year.

15. Notice of the annual meeting shall be given each member by the secretary not less than one week previous to the date of this meeting.

16. Special meetings may be held at any time upon call of the president by written notice mailed to each member five days before the meeting. Special meetings shall be called by the president upon request in writing by any ten members.

17. Election shall be by ballot, conducted by two scrutineers appointed by the chairman.

18. The books of the association shall be audited each year before the date of the annual meeting.

Amendments

19. This constitution or any part thereof may be amended at any regular or special meeting by a two-thirds vote of the members present.

BY-LAWS

1. The manager shall have charge of the collection and sale of all eggs, and shall apportion the returns among the members according to the quantity and quality received. He shall be responsible at all times to the board of directors.

2. The remuneration of the manager shall from time to time be fixed by the board of dierctors, and may be by way of salary or commission.

3. Members of the association are subjected to the following regulations:

(a) They must deliver all eggs not to be used for their own housekeeping or breeding purposes at a time and place determined by the board of directors. All eggs must be unbroken, clean, of good size and not more than one week old.

(b) Before being delivered all eggs must be stamped at the broad end with the stamp supplied by the board of directors. The stamp is the property of the association and must be returned to the manager when membership ceases.

(c) No member shall be permitted to dispose of eggs, through the association, from hens other than his own.

(d) No member shall be permitted to loan or borrow stamps belonging to the association.

(e) Poultry houses must be kept clean and sanitary.

(f) No nest eggs that will, in any way, taint the new-laid eggs may be used.

(g) Eggs must be gathered twice a day and kept in a cool room, free from draught, dampness and foul odors, and, if possible, in a temperature not exceeding 60 degrees.

4. In case the members do not observe the rules of the association, a system of fines may be adopted and enforced by the directors.

5. These by-laws may be amended at any regular or special meeting by a two-thirds vote of the members present.

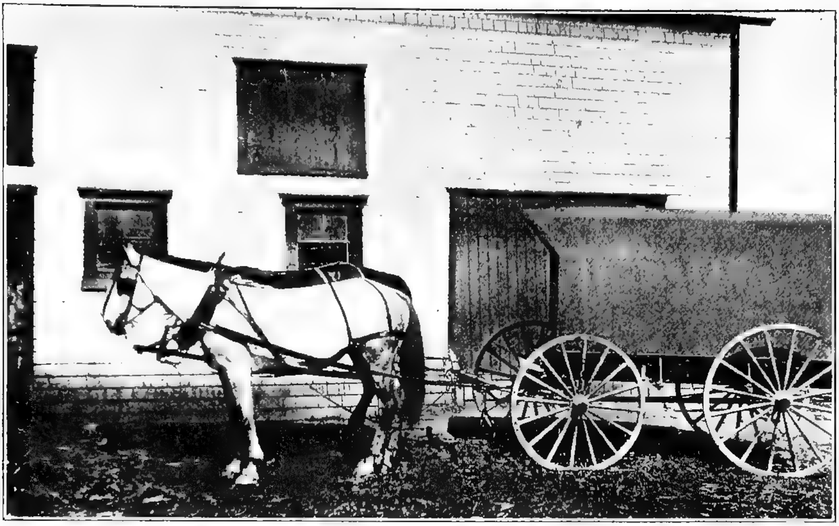


Fig. 6. Covered wagon used to collect eggs from Canadian organizations.

ASSOCIATIONS SHOULD ISSUE STAMPS

We are very much interested in the proposed plan to establish a State brand for Missouri produced eggs. As long as each club uses its own method and brand, or standard, we will not be able to make much headway. I have had numerous requests from people in various parts of the State for information concerning marketing.

The Missouri Poultry Association should issue and control stamps which should be put on as a seal to every carton. There would be some little expense to meet this, and to offset it each club formed might be required to pay a small sum, according to the members it has or according to the number of eggs marketed. The idea for the producer having a brand is all right for the large producers, but what good can it do the producers who have only a few dozen eggs a week? And this type of producer is vastly in the majority.

I see no reason why a State organization could not be perfected and a State brand and standard obtained. Then each locality could organize its clubs and eggs could be shipped to one central market and then on to the consumer in the original cartons. The cartons could all carry the same advertising and each carton would help to advertise the project. These numerous rivulets would make quite a stream of good eggs and in a short time this brand would be in demand at prices far above that of the unknown egg.

The requirements of membership in some Missouri Egg Marketing Clubs are as follows:

First—The eggs must be infertile. Remove the male birds from the flock immediately after the breeding season and market no fertile eggs.

Second—The eggs should be gathered daily so that none remain in the nests over night.

Third—Only nest eggs such as gypsum or china should be used.

Fourth—Do not sell eggs which come from stolen nests.

Fifth—Avoid dirty eggs by using clean quarters. Dirt may be removed with a damp cloth, but eggs should not be washed.

Sixth—Sort out exceedingly large or small eggs.

Seventh—Market only eggs of standard size, 24 ounces or more to the dozen.

STORE EGGS IN COOL PLACE

Eighth—Store eggs in cool, clean, well-ventilated places, and away from flies. Protect them from extremes of heat and cold when enroute to market.

Ninth—Eggs are to be packed in Farm Bureau cartons and sealed on the farm. All cartons must be dated. This will protect you from the carelessness of someone else.

Tenth—Market eggs at regular intervals, two or three times a week.

The object of the organization is to improve the quality of eggs leaving the farms of this club and from the neighborhood and county, to encourage proper methods of handling of eggs on the farm, so as to insure their reaching the market in satisfactory condition with a minimum of loss, by improving the quality to tend to increase the price paid for eggs, and in this way make poultry keeping more profitable. Statistics show that great losses occur relative to marketing eggs during the summer months. Conservative estimates place the loss at nearly one-fifth the entire product leaving the farm. Investigation has also shown that a large percentage of this loss occurs on the farm. and also that this loss is borne quite largely by the producer. These losses can be prevented and if they are prevented there is no reason why the farmer cannot realize a greater price for his eggs.

This market is ours as long as we can meet its requirements. Hence, it is up to us to be careful, and any little thing we can do to make our produces better or more attractive is desired.

The New Jersey plan for co-operative marketing is a still bigger step than the egg circle. By having all of the organizations federated the chances for better prices are more favorable, and it is possible to reduce the price of handling the eggs. By having an agent in one of the large cities, who can look personally after sales, and by dividing the expense it would be possible to greatly reduce the cost of handling the eggs and insure good prices. We publish the following by permission of Prof. Harry Lewis:

PURPOSES AND SCOPE

We should not be led astray into thinking that although our plan may ultimately include the marketing of all New Jersey produced eggs that now go through wholesalers' hands in large cities, this plan will have but little effect upon the market price of the general supply. We should remember that although our State is known as a poultry State, we supply New York City with only one or two per cent of its total receipts. On the other hand, our eggs are in a small class, and if only first-class, fresh-laid eggs are considered, New Jersey is a large factor. Especially is this true of white-shelled eggs. The purpose of this plan and the need of the average poultry raiser in the State, as the committee understands conditions, is a **more efficient method of supplying particular people in large cities with the finest quality eggs which can be produced.** This includes the elimination of loss to a large degree, from improper methods, little or no grading, and wholly unsatisfactory systems of distribution. Surely the New Jersey Poultrymen do not want to compete with the western producer in the production and selling of only quality eggs. Because of our nearness to the greatest market section in the country we have certain advantages which remain for us to profit by if we will. Are we going to neglect our birthright by continuing our slip-shod methods of marketing? The demand in New York City, which we should remember is the greatest egg market in the world, is for food products of superior quality and appearance. We can furnish them the best grade of eggs at less cost and greater profit to ourselves than can poultry raisers of any other district. We can, but in many cases we do not. The average producer is as **ignorant of market conditions** as the average market man in a large city is of any line of farming. We are producing quantities of eggs of the quality in such demand, but they never realize what they should do for us because of our inefficient methods of marketing. The persons who demand this high class of products not only ask for freshness, quality and appearance, but they desire that there will never by any chance be a "mistake." They want to feel sure that the supply is of sufficient volume to furnish them at all times. If any one of these factors is lacking this class of trade is diverted. The committee believes that only through co-operative efforts of many careful producers can this trade be permanently secured and held. The possibilities of this plan are almost unlimited. The task at hand is to get it established. It is one step, and we believe an important one, in the work which the many poultry organizations, with the aid of the State and Federal Departments, are striving to accomplish, namely, to develop the poultry industry into **a profitable, legitimate business,** capable of returning fair profits to those interested in it and who are willing to give it close study and well directed management.

OUTLINE OF PLAN

The plan includes the selection of reliable, experienced dealers in the large cities to act as our agents. We are starting with one in New York City. Instead of starting under a handicap by setting up a new store with inexperienced operators, as has often been tried, we recognize that the **selling end of the business is intricate,** that there are many conditions which exert a vital influence upon the success or failure of such an enterprise that only experienced men can successfully deal with.

All members of local associations which belong to the Federation are privileged to send their eggs to this agent. They will be carefully graded and packed by the agent. This insures uniformity in the product as it reaches the trade, and does away with all detail work which some producers have been forced to take up.

The agent will carry on the business of selling in his own way, but under the supervision and with the full co-operation of the Federation.

Returns will be made on the day of sale and all possible energy will be used to move the eggs rapidly.

Arrangements can be made by individual shippers to have a part or all of their eggs stored during seasons of heavy production and consequent low prices. The storing facilities will be of the best and our agent is well acquainted with this end of the business.

REQUIREMENTS TO SHIP

The only requirements made of those who desire to take advantage or who wish to support this project are: Firstly, they must be **members in good standing** of a society belonging to the Federation of Poultry Association; and, secondly, that they will so manage and care for their flock that only **eggs of high quality and flavor** will be produced.

The secretary of any local association can secure through the committee "shippers' numbers." Shipping tags will be forwarded to the shippers to use on each shipment. This tag, marked with a shipper's number, insures recognition of the shipment by the agent and the shipper will be credited accordingly.

Small eggs, or those of poor shape, etc., will be disposed of by the agent through suitable channels, but shippers should realize that this association is endeavoring to establish a reputation for excellence and that high-grade goods are going to receive special attention.

Upon complaint to the committee by the agent a shipper's number can be cancelled, if upon investigation such action seems to be to the best interest of the association. It sometimes happens that eggs from a flock will be of poor flavor on account of unwise feeding or some other cause. This cancellation clause is inserted to protect the trade.

DUTIES OF THE AGENT

The agent will receive all eggs from shippers bearing an authorized number. It is urged that where eggs are shipped by express that they be shipped collect. The agent will then pay the charges, deducting the same when returns are made. This sometimes facilitates the collection of damage charges, etc.

Each shipment will be graded and candled separately and the shipper given credit for the following grades: **First whites and first browns,** will be large, clean eggs of the highest quality. They must weigh twenty-four ounces per dozen. The whites must have chalk-white shells and tinting or color will place them in the class of browns. In warm weather, eggs to come under these classes must be only a few days old. It will be found that conditions under which eggs are kept will have more influence in determining the quality than mere number of days. **Seconds** will include all small, shrunken and dirty eggs which may be received. Many times large numbers of small eggs are produced on the best farms from flocks of pullets. Good markets can be found for these in the large cities. Shrunken eggs are those in which the moisture has more or less evaporated. This condition is often found in eggs held for several days or more. It should be guarded against. When a small shipper is securing only a few eggs each day it may become impossible to fill a case, or even half a case, often enough to prevent this condition. This matter should be discussed by the local association with the idea that two or more raisers combine and ship together. In this way frequent shipments can be made, which is the only way to insure the best results in warm weather. **Checks** is a market term applied to all eggs cracked or broken.

Complete accounts must be kept by the agent, which will be open to the association's committee at all times. These accounts must include each sale, the purchaser's name, price paid, etc.

The agent will endeavor to develop a large trade for our best eggs packed in one-dozen cartons. Our New York agent is to put a special man on this work.

All eggs not sold in cartons will be sold in standard thirty-dozen cases.

DISTRIBUTING PACKAGES

The association will supply the agent with suitable cartons and with labels to place upon the sides of cases containing our eggs. On the cartons and labels will be printed the statement that these eggs are produced on poultry plants managed along the most approved lines, and that every effort has been made to insure the high quality of the products. That the eggs are not only produced, but are graded, packed, sold and guaranteed by this association of several thousand actual producers. A small slip will be inclosed in all packages covering in some detail the purposes and aims of the association. Of late years there has been much agitation upon more direct dealings between producers and consumers. The time is now ripe to inaugurate such a plan as this. All eggs sold will go out under definite trade names (probably copyrighted). In this way a buyer can easily know how and where to secure similar goods again.

BUILDING UP TRADE

This will be largely in the hands of the agent. However, every member should consider himself or herself responsible for advertising our goods. We are going into this project at the right season. Receipts will be small to begin with, but should increase to large quantities each spring. It might be well for the association to enter into a publicity campaign, if possible, and advertise the goods extensively. On the other hand, it may be better to work up the trade slowly and "feel our way along." Many co-operative projects have been started before and failed. Most of them have endeavored to start large.

Our best eggs, packed in cartons, should find a demand among retail stores dealing with particular buyers. Those sold in case lots will go to clubs, hotels, steamship lines, or other large consumers and retailers.

MAKING RETURNS

This phase of the subject has caused the committee the greatest amount of work and is, perhaps, the most important part of the plan. We have long felt that the average producer was very ignorant of the conditions existing in the large markets. The more we become acquainted with the market conditions the more certain are we of this fact. Under recent conditions most commission dealers **claim to handle eggs on a five per cent basis.** There is much dissatisfaction concerning this method among producers. There seems to be a general feeling among farmers that commission dealers are dishonest. There certainly **is a lack of sympathy and co-operative spirit which is so important in efficient marketing and which should be extended to the consumers.** We find that authorities agree with us in declaring that, as the business is carried on in New York City today, **a five per cent commission does not allow the dealer a fair profit.** It is doubtful if it covers expenses. This may explain much of the fault found with commission dealing. Under present conditions the shipper rarely feels that he is "on the inside" of transactions in which his goods are concerned. He can only take his returns and think that he is fortunate. The aid of the committee in determining upon the methods of making returns best suited to our plan has been to insure an open, straightforward plan in which any shipper can feel satisfied that he knows all there is to know. Because of the extra work involved in grading and packing, and because we have to insure this **"one price and one commission"** innovation, the percentage of commission allowed to the agent is double what has heretofore **apparently** been the case. We allow ten per cent to the shipper, and deduct an additional two per cent to cover the cost of cartons, labels, etc. This will make a total of twelve per cent to cover the cost of marketing. No doubt many will consider this almost prohibitive. In reply we can only say that we believe that this committee has conducted the most exhaustive investigation into this subject that has ever been made for such a purpose. It is our belief that it is **no higher than the average commission charged in reality** on average shipments by commission dealers and wholesalers. We do not believe that all commission men or wholesale dealers in eggs report receipts less than the prices actually received, but we do believe that producers are entitled to know just how their goods are sold and exact details connected with their disposal. Under present conditions such knowledge is almost impossible to get. More than that, if there is going to be any money made by holding the eggs for a day or two, by storing them for a longer or shorter period, or by handling them in any manner, we believe the producer is the party who should profit by it. It is a well known fact that larger profits are made by commission dealers in the fall, when prices are rising, than in the spring, when prices are going lower every day. This should not be so, and would not if the dealers acted purely as commission agents for their shippers. In the spring, when current receipts glut the market and the prices are lowering day by day, the dealers, in order to satisfy their shippers, often have to return the prices quoted on the day of arrival, even though the sales are not made for a day or two or until the price has fallen a cent or more per dozen. In extreme cases perhaps such conditions occur. In the fall, however, the losses of the spring are recovered—and who knows how much more? This plan **does away with all such "queer transactions."** Producers in the manufacturing business or in any other lines **know** who their goods are sold to, they **know** how much they are sold for, and they **know** how much it costs to sell their goods. In disposing of perishable stuffs produced on the farm and sold in distant markets definite prices cannot be agreed upon by both parties in any practical way. The place for the average producer is on the farm, producing. The selling end certainly needs a man acquainted with credit conditions, supply and demand, and a hundred other important details. The goods may change many degrees between the time they leave the producer and the time they reach the retailer, or consumer. It was this condition that undoubtedly led to the commission method of doing business. In its real, or should we say theoretical, form this method was ideal. The commission dealer received the goods, sold them for the highest price he could consistently charge, and returned **that price** to the shipper, less a percentage charge to reimburse him for legitimate expenses and allow him a fair profit. It was impossible that with the rapid growth of our large centers of population, and consequent greater distance established between the producer and the consumer, evils should not develop in this method. The very nature of the method almost invited deceit. The producer depended entirely upon the honesty of the dealer. The producer understood that the dealer was acting purely as his agent. An illustration of how far the present condition of the commission business is removed from the ideal is seen by the action of many of the firms in New York City during past years. The New York State law-making bodies enacted laws requiring the registration and filing of a bond with an authorized party of all persons doing commission business. These laws further called for a more or less definite supervision of the business by the State. Many of the companies, previously engaged in the commission business, are now purchasing for themselves at their own prices the products from their shippers. In this way they go out of the commission business, and hence are "not hampered" by "foolish" laws. We believe that certain advantages, as already mentioned, will be received by shippers who take advantage of this co-operative plan and that the actual **cost will be no higher,** while the prices received for the eggs should be very satisfactory. Not only does this plan include a close supervision of all sales and business transactions, but, because of the immensity of the business we may build up, the agent must realize that his greatest gain lies with this plan of co-operation. It has always been recognized in the wholesale business that the large **shipper received greater attention** from the dealer than the smaller one. Therefore, co-operative associations should be the largest shippers in any market of eggs of similar quality.

DUTIES OF LOCAL ASSOCIATIONS

Much of the success of this plan will be due to the hearty support of the officers and members of the various associations about the State.

The secretary of the local association must apply to the committee for "Shippers' numbers" in order to secure recognition by the agent for goods shipped by members. The secretary should use his best judgment in calling for numbers, as there may be cases where careless raisers, who are members, still persist in allowing their hens to consume food not consistent with the production of fine eggs.

The committee asks that the following facts be brought to the attention of each association by the secretary at a regular meeting:

One. Investigators in this and foreign countries, who have studied the problem of food stuff distribution and its relation to the high cost of living, agree that efficiency can be best secured through co-operative selling on the part of the producers and co-operative buying on the part of the consumers.

Two. Of the various methods of disposing of eggs practiced by New Jersey poultrymen most of them have serious disadvantages. Nearby markets are small and often very plentifully supplied. Only small producers can afford to keep up a retail trade. By sending eggs to dealers in distant large cities no assurance can be had that the returns are what they should be. Is there not a great need of a well perfected method of marketing, for raisers located in rural communities? Is there not room for **improvement in prices received by all?** Does not New York City, especially, afford a most promising market for superior eggs, packed and sold right? Have we not learned by the example of our enterprising friends in distant sections that co-operative marketing has great practical possibilities? Consider for example, the Southern California Fruit Growers Exchange, which handles seventy-five per cent of the orange crop in that State; the Texas Onion Growers' Association, which has made possible the development of that enormous industry during the past ten years; and the many apple growers' societies in western states. Consider the success of the farmers' organizations in this State, organized by the wide-awake potato growers and truck farmers in several southern counties. There is an unlimited demand for best quality eggs in New York. Is there any greater influence we can create to draw new poultrymen to the State and to assist us in building up profitable poultry farms than by establishing a **successful marketing plan?**

Three. No such extensive co-operative plan for the handling of eggs has ever been introduced or tried out in this country. Co-operation among the producers elsewhere has long been practiced and proven to be of great benefit to all.

Four. On account of the agitation and publicity given to the subject of co-operation during recent years, it would seem that now is an especially desirable time to take the initiative in this step and inaugurate a truly co-operative method of direct dealing from farm to consumer.

Five. Notwithstanding the failures of many previous co-operative efforts which have been tried out, this plan embraces certain factors that have been supported by commercial interests, this plan **has been suggested, organized and adopted by a group of actual producers.** In the past, many co-operative efforts have been supported by only a few shippers, necessitating an irregular supply of products, with great scarcity at certain seasons. Our plan embraces thousands of members, and because of this State-wide scope should include every one who produces eggs in large enough quantities to ship to the large markets.

Six. Finally, the committee desires to state that this plan of co-operative marketing is the result of the experience and study, not only of its members, but also of the best authorities upon this subject in the United States.

These are some of the facts that each association should bring to the attention of its members and urge that the plan be given the hearty support of all. It must be remembered that by far the greatest influence upon which the success or failure of this plan depends are those with which the plan comes in contact during its early life. The firm **establishment** of this method is the **important** thing and we hope that everyone will **boost** and that **criticisms** will be withheld until a thorough trial is given.

POULTRY CLUB WORK

Much attention is being paid to the poultry club work in many states. A great number of poultry departments in our leading colleges have men who give their entire time to this line. There is no doubt but that it is an excellent plan for they are creating an interest in poultry among the young people, who in turn get the older people interested in better methods of poultry keeping. The general rule is to have each member of the club set twenty-five eggs under hens and keep accurate records. They are instructed as to the best methods of feeding and caring for the growing stock. They are asked to write essays on how they cared for their flocks and exhibit fowls at the fall shows that are nearest them.

The following season they are expected to put a pen of the birds that have been reared into a laying house and feed them throughout the winter and keep records. If the boys and girls learn these fundamental lessons well, by putting them into practice, they will be greatly benefited and will acquire an interest in the work that will increase as the years go by.

The prize money must be raised locally from enterprising citizens who are interested in the development of the community, and in the boys and girls learing lessons that will be useful to them later in life in increasing their earning power—whether they live in the small town, the city, or the country.

The Bureau of Animal Industry has issued a bulletin containing complete instructions, which you can write for if you are interested in the organization of poultry clubs among the boys and girls of your county. We suggest another very interesting line of work to be undertaken by the rural schools. Many communities are seeking to better their rural schools and make them more effective. They are becoming agencies for the training of boys and girls for rural life rather than for life in the cities. In many counties these schools could inaugurate egg contests. They could apply to breeders, who might be interested in the publicity that the contests would give to them, and ask that they allow the institution to feed and trap-nest a pen of hens for the winter, using their names as the owners of the birds. This would certainly create great interest in better feeding methods and better methods of breeding. An actual demonstration of proper care of fowls in each county community would certainly increase the interest in the poultry work. If the schools, too, were engaged in the marketing of eggs, thousands of dollars would be brought into the community as a result of such effort.

The contests could be carried on in connection with some cosmopolitan paper and the results published each month in the papers of the county. More than likely the leading poultry journal of the state in which the contest was being conducted would publish the report.

Such a plan would certainly carry the teaching of the Experiment stations direct to the people who need the instruction and create a great demand for better stock.

BENEFITS OF CO-OPERATIVE PRODUCERS' ASSOCIATION

There are two or three districts in California where hundreds of people are making a living exclusively from the production of poultry and eggs. Especially is this true of the Petaluma, Los Angeles and Hayward districts. The same is true in the states of Oregon and Washington. There are men and women who have only two to five acres of land on which they keep 1,000 to 3,000 hens. Many of these people have bought and gradually improved their land, built comfortable homes, and accumulated some surplus cash, absolutely and solely from the sale of poultry and eggs. They devote all of their time to poultry, and they purchase all their feed. Such results have been made possible only because of their co-operative producers' organization.

In the Hayward district the producers organized such an association, a co-operative organization. They built one warehouse in which and through which to transact their business. The association buys feed and supplies in car load lots. By purchasing fencing material, incubators, equipment, baby chicks, feed or other supplies in large quantities, they can save freight and express and obtain the lowest prices. By selling their products co-operatively through their manager, they are able to furnish a uniform product of high grade and command the best prices. So successful has been their venture that the Hayward Producers' Association has just erected another very large warehouse. The organization seems to be very thrifty and beneficial to its members. It has a membership of several hundred, we understand.

THE MOST SUCCESSFUL ORGANIZATION

The largest and most successful organization of poultry producers that are known of is the Poultry Producers of Central California with their main offices at Petaluma and San Francisco. While I was in charge of the Live Stock Department at the World's Fair at San Francisco, I was invited to speak to the members of this organization at Petaluma and Hayward. It was a small, struggling organization at that time. I urged them to stick and co-operate, and the result has been that they now have an organization with three-fourths of a million capital on which to operate. They have turned the production of eggs and poultry in Central California form a "guess" to a sure thing and a profitable business for all producers who use correct methods. Their product is marketed for them by this Association and they are insured the highest prices. Their eggs top the New York and London markets. They have their own warehouses, collecting points and facilities for grading, handling, marketing or storing their eggs. It is only through co-operation that they have been able to do this. Their business has grown to such proportions that they keep a salesman in the best markets at different seasons of the year to dispose of their product to the best advantage.

Their work has been so noteworthy that I herewith give you their by-laws, sales agreement and complete working plan. It is worthy of your consideration if you ever expect to be associated with a co-operative association.

BY-LAWS OF THE POULTRY PRODUCERS OF CENTRAL CALIFORNIA, INC.

ARTICLE I

Corporate Seal

The Corporate Seal shall bear the inscription, "Poultry Producers of Central California, Inc., Incorporated October 31, 1916, California."

ARTICLE II

(1) The affairs of this Corporation shall be managed by a Board of eleven (11) Directors. They shall be elected at the annual meeting of the stockholders, to serve for one year and until their successors shall be elected and qualify.

One Director shall be a poultry producer in the Sacramento Valley District, comprising the counties of Sacramento, Napa, Placer, Tehama, Butte, Solano and such other counties in the Sacramento Valley or adjacent thereto as may not be specifically included in either of the districts mentioned below.

One Director shall be a poultry producer in the San Joachin Valley District, comprising the counties of Stanislaus, San Joaquin, Merced, Madera, Fresno, Kings and Tulare.

One Director shall be a poultry producer in the Santa Cruz District, comprising the counties of Santa Cruz, Monterey and such other adjoining counties as may not be specifically included in some other district mentioned herein.

One Director shall be a poultry producer in the Alameda County District, comprising the counties of Alameda and Contra Costa.

One Director shall be a poultry producer in the Santa Clara and San Mateo Counties District, including San Benito County and the City and County of San Francisco.

Five Directors shall be poultry producers in the Sonoma County District, comprising the counties of Sonoma, Marin, Mendocino and Humboldt.

One Director shall be proposed by the Market Director of the State of California.

This Director proposed by the State Market Director shall represent all the districts above specified and conserve the general interests of all the stockholders of this Corporation.

An informal primary shall be held, as the Board of Directors may determine, to select a nominee for each such District. The said Market Director shall propose at least one name, to be placed in nomination by the Secretary. The Stockholders shall then cast their votes, in accordance with the laws of the State of California, giving proper care to the representation of each District, as well as to their general interests as stockholders. Qualifications of the Directors and the representation as to districts shall be subject to amendment only at a stockholders' meeting, held after special notice to all the stockholders.

(2) Six (6) Directors shall constitute a quorum of said Board and the affirmative vote of at least four (4) Directors shall be necessary to pass any resolution or authorize any corporate act.

(3) In addition to the powers by these By-Laws expressly conferred upon it, the Board may exercise such powers and do such lawful acts and things as the Statutes or the Articles of Incorporation of these By-Laws do not specifically require to be exercised or done by the stockholders.

ARTICLE III

Vacancies

Vacancies in the Board shall be filled at a meeting of the Board by election by the remaining Directors. Those elected shall hold office until the election of their successors at an annual meeting of the stockholders.

ARTICLE IV

Powers of Directors

The Directors shall have power:

(1) To call special meetings of the stockholders. They must call a meeting at any time upon the written request of the stockholders holding one-fifth of the issued capital stock of the Corporation;

(2) To appoint and remove officers, general agents, agents and employees, contract for their employment, fix their duties and compensation and require from them security for faithful service;

(3) To manage all of the business of the Corporation and make for it rules and regulations;

(4) To incur indebtedness for the conduct of the business, the terms and accounts of which shall be entered on the minutes of the Board. The President or a Vice-President shall sign officially all written promises to pay debts, and the Secretary or Treasurer shall countersign the same;

(5) To foster and encourage each to include owners of at least five thousand hens, the formation of local associations of poultry producers in each district, to aid in the general purposes for which the Corporation was organized.

ARTICLE V

Duties of Directors

The Board of Directors shall:

(1) Cause to be kept a record of its meetings and of the proceedings of the stockholders; and cause a full statement to be made in writing at the regular annual meeting of the stockholders, showing in detail the assets and liabilities of the Corporation and generally the condition of its affairs;

(2) Meet at least once a month at a time to be determined by the said Board; and each Director shall, for the expenses of attendance at each of such meetings, receive such sum as may be allowed by resolution of the Board, but as Director shall receive no salary or other compensation;

(3) Declare dividends out of the surplus profits when such profits shall, in the opinion of the Directors, warrant the same;

(4) Supervise all officers, agents and employes and see that their duties are properly performed;

(5) Cause to be issued to stockholders certificates of stock for the amounts of their holdings.

ARTICLE VI

Officers

The officers shall be a President, a First Vice-President, a Second Vice-President, a Secretary and a Depositary (which shall act as Treasurer), to be elected by and hold office at the pleasure of the Board of Directors. The compensation and tenure of office of all officers shall be fixed by said Board.

ARTICLE VII

President

The Board of Directors, at its first regular meeting, shall elect one of the Board as President; and if at any time the President is unable to act, the First Vice-President, or (if the First Vice-President shall at any time be unable to act), the Second Vice-President shall perform his duties; and if both the First and Second Vice-Presidents are unable to act, the Board shall appoint some other member thereof to his place.

The President—or, in his absence, the First Vice-President, or in his absence, the Second Vice-President, or, in his absence, the Director appointed as above provided, shall:

(1) Preside over all meetings of the stockholders and Directors;

(2) Sign all certificates of stock and all contracts and other in-

struments of writing which have been first approved by the Board of Directors;

(3) Call the Directors together whenever it is deemed necessary by him, and shall (subject to the advice of the Directors) have general direction of the affairs of the Corporation, and shall discharge such other duties as may be required by the By-Laws or by the Board of Directors;

(4) The President, or a Vice-President, or three of the Directors, may call special meetings of the Directors at any time, and notice shall be given of such called meetings by leaving a written or printed notice at the last-known place of business or of residence of each Director; or such special meetings may be held at any time by consent of all Directors in writing.Each Director must, at the first meeting after his election, cause his address to be entered in the minutes, to which address all notices may be directed until similar notice and entry of residence has by him been given in writing to the Secretary, who shall register the same. Such service of notice shall at the next meeting be entered on the minutes of the Corporation: and said minutes, upon being read and approved at subsequent meeting of the Board, shall be conclusive upon the question of service.

ARTICLE VIII

Secretary

The Secretary shall:

(1) Keep a record of the proceedings of meetings of the Board of Directors and of the stockholders;

(2) Keep the corporate seal and the book of blank certificates of stock, fill up and countersign all certificates and make the corresponding entries in the margin of such book, on such issuance; affix said seal to all papers requiring a seal;

(3) Keep a transfer book and a stock ledger in debit and credit form, showing the number of shares issued to and transferred by any stockholder and the dates of issuance and transfer;

(4) Keep proper account books, and discharge such other duties as pertain to his office and are prescribed by the Board of Directors;

(5) Serve all notices required, either by law or by the By-Laws of the Corporation; and, in case of his absence, inability, refusal or neglect so to do, then such notice may be served by any persons thereunto directed by the President or a Vice-President of the Corporation;

(6) Record and vote all proxies made out in his name as directed by the makers of the proxies.

The Board may appoint an Assistant Secretary and may delegate to him any or all of the duties or powers herein assigned to the Secretary.

ARTICLE IX

Treasurer

The Treasurer shall receive and keep all the funds of the Corporation and pay them out only on the check of the Corporation, signed as authorized by resolution of the Board of Directors.

ARTICLE X

Executive Committee

(1) The Board of Directors shall have an Executive Committee of five (5) members, which shall meet as and when its members direct; said Committee shall have such powers and duties as may be delegated to it by the Board of Directors, and such powers and duties may be any or all the powers and duties granted or assigned hereunder to the said Board.

Said Executive Committee shall be composed of the President, General Manager (if he be a member of the Board of Directors), the Director proposed by the Market Director of the State of California, and the remaining members shall be elected by the Board of Directors in its discretion from the Directors.

(2) Said committee shall hold office at the pleasure of the

Board and shall keep records of its proceedings and report monthly to the Board;

(3) Said committee may meet and vote upon any subject within its powers at their discretion and in any manner, by telegraph, telephone or otherwise—Provided, however, that all matters, other than ordinary commercial details, be finally set down in writing in the minutes of the said committee and signed by the members thereof.

ARTICLE XI.

Location of Office

The principal office and place of business of the Corporation shall be at San Francisco, California, and the Corporation may, at the discretion of the Board of Directors, also maintain offices at such other places as may be expedient.

ARTICLE XII

General Manager

The Board of Directors may elect a General Manager of the Corporation, under terms and conditions of service and remuneration satisfactory to the said Board. The General Manager may be a member of the Board of Directors.

ARTICLE XIII

Offices Held by Directors

One Director may be elected to and fill only one office on the Board of Directors of this Corporation. Any Director may hold the position of General Manager in addition to any elective office hereunder or may be employed by the Corporation in any capacity, under any terms; but no such employment shall become effective unless so determined by the vote of at least seven members of the Board of Directors.

ARTICLE XIV

Any Director or other officer may resign his office at any time, such resignation to be made in writing and to take effect from the time of its acceptance by the Board of Directors.

ARTICLE XV

Duties of Officers May Be Delegated

In case of the absence of any officer of the Corporation, or for any other reason that the Board may deem sufficient, the Board may delegate the powers or duties of such officer to any other officer or to any Director for a stated time, Provided, that a majority of the entire Board concurs therein.

ARTICLE XVI

Books and Papers

Such books and such papers as may be placed on file by vote of the stockholders or Directors shall, at all times during business hours, be subject to the inspection of the Board of Directors and of any stockholder.

ARTICLE XVII

Certificates of Stock

(1) Certificates of stock shall be of such form and device as the Board of Directors may direct; shall be signed by the President or a Vice-President and countersigned by the Secretary or Assistant Secretary; and the certificates of each class of stock shall express on their face the number, date of issuance, the number of shares for which and the person to whom they are issued, and the substance of such other appropriate provisions as appear in Paragraph Sixth of the Articles of Incorporation of the Corporation; Provided, that no stock shall be sold except to poultry producers (except that the Director proposed by the State Market Director, if he be not a poultry producer, may hold one share of stock to qualify

as a Director of this Corporation), and, Provided further, that before the issuance of any certificate of stock to poultry producers, such poultry producers must have signed as a condition precedent to the receipt of such certificate of stock, agreements with the Corporation for the sale of all their products to the Corporation, subject to present existing contracts, in terms substantially the same as those set forth in the form of agreement herein contained (See appendix.);

(2) The certificate book shall contain a margin on which shall be entered the number, date, number of shares and name of the person expressed in the corresponding certificate.

ARTICLE XVIII

Transfer of Stock

(1) Shares of the Corporation may be transferred at any time, subject to the provisions of Paragraph Sixth of the Articles of Incorporation and Article Seventeen of the By-Laws, by the holder or by his legal representative, by endorsement on the certificate of stock. But no transfer shall be valid until the endorsed certificate has been surrendered and unless all other provisions of the said Paragraph Sixth of the Articles of Incorporation and Article Seventeen of the By-Laws have been observed;

(2) A surrendered certificate shall be canceled by the Secretary before a new one is issued in lieu thereof, and the Secretary shall preserve the certificate so canceled as a voucher. If, however, a certificate is lost or destroyed, the Board of Directors may order a new certificate issued as may be by law permitted.

ARTICLE XIX

Meetings

(1) The annual meeting of the stockholders shall be held at the office of the Corporation at San Francisco, California, on the first Monday in October of each year, beginning with the year 1917, and shall be called by a notice printed in one or more newspapers published in the City and County of San Francisco, as the Directors may instruct, for at least fifteen days preceding the day of meeting, and by a notice in writing, signed by the President or Vice-President, delivered to each stockholder personally or mailed to him (postage prepaid), to his last-known address at least twenty days before the day of such meeting;

(2) No meeting of stockholders shall transact business unless a majority of the entire subscribed capital stock is represented either in person or by proxies in writing, except to adjourn from day to day or until such time as may be deemed proper;

(3) At such annual meeting Directors for the ensuing year shall be elected by ballot, in the manner provided by law and in these By-Laws, to serve for one year and until their sucessors are elected. If, however, for want of a quorum or other cause a stockholders' meeting be not held on the day above named, or should the stockholders fail to complete their elections or such other business as may be presented for their consideration, those present may adjourn from day to day until the same shall be accomplished in the manner provided in the Civil Code;

(4) Special meetings of the stockholders for any purpose or purposes other than those regulated by statute may be called by the President or Board of Directors;

(5) Business transacted at all special meetings of stockholders shall be confined to the objects stated in the call and matters germane thereto;

(6) Written notice of a special meeting of stockholders stating the time, place and object thereof shall be mailed (postage prepaid) to each stockholder at such address as shall appear on the books of the Corporation in the manner specified in this Article for annual meetings of stockholders, except that there shall not be required any notice by publication.

ARTICLE XX

Waiver of Notice

Any stockholder, officer or Director may waive in writing any notice required to be given under these By-Laws or otherwise.

ARTICLE XXI

Amendments

The By-Laws may be altered or amended at any meeting of the stockholders by a majority vote of all the stock issued and outstanding voting in favor of such amendment; Provided notice of intention to amend shall have been contained in the notice of the meeting.

PRODUCE SALE AGREEMENT

This Agreement, made between the POULTRY PRODUCERS OF CENTRAL CALIFORNIA, INC., a California corporation organized for co-operative marketing of poultry products, with its principal office at San Francisco, California. hereinafter called the Buyer, first party, and the undersigned poultry producer, hereinafter called the Seller, second party:

Witnesseth

In consideration of the mutual obligations herein and of the agreements by each of the parties hereto to be performed and in compliance with the By-Laws of the Corporation and in pursuance of the express aims of the corporation for co-operative marketing and for the elimination of speculation in poultry products and in consideration of similar obligation undertaken by many other poultry producers:

1. The Buyer agrees to purchase and the Seller agrees to sell and deliver to the Buyer, the eggs and the poultry, subject to Paragraph 6 hereof, produced or acquired by or for him during the year 1920 that he intends to sell or market in any event, for the price to be secured by the Buyer as hereinafter mentioned.

2. (a) The Buyer agrees to resell said eggs and poultry, together with similar products from other Sellers, at the best prices obtainable in the Buyer's judgment under market conditions and to pay over the amounts received thereby, as payment in full, to the Sellers named in contracts generally similar to this contract, according to the quantities of eggs and poultry delivered by the respective Sellers, subject to Paragraph 6 hereof, after deducting therefrom the cost of transportation, the cost of cases and fillers, and an amount for selling costs and expenses not to exceed one cent per dozen for eggs and eight (8) per cent of gross selling price for poultry, all as determined by the Buyer, in its sole and exclusive discretion.

(b) If, at the end of the fiscal year, a surplus is available from the said deduction for selling costs, the Buyer shall refund such surplus to the Sellers, in proportion to the value of their respective deliveries, after making appropriate reserves for a reasonable dividend, advertising and other commercial purposes, all in the discretion of the Buyer.

3. (a) The eggs delivered by the Seller hereunder shall become the absolute property of the Buyer and shall be sold with other eggs of like grade and like quality purchased by the Buyer under contracts generally similar to this contract and the amount to be paid to the Seller weekly shall be based on the proportional value in eggs delivered by him to the Buyer, out of the total weekly receipts of moneys from the sale or other disposition of the eggs and inventory value of unsold eggs, according to quality and grade, less the deductions hereinabove mentioned, all as determined by the Buyer.

(b) The Buyer shall in its discretion store or warehouse eggs to be held for the season of minimum production or for a better market or otherwise. Any eggs so stored or warehoused shall be deemed to have been resold at the current market value on the dates of storage as conclusively determined by the Buyer; and the sale price, so calculated, shall be added to the receipts from the eggs actually sold during that week and shall be distributed as part of the weekly receipts as above provided.

(c) Any net profits, after paying all warehousing charges, interest, taxes, insurance and other costs, resulting from the ultimate resale of such eggs by the Buyer shall be divided proportionately, on the basis of the value of the respective deliveries, among the Sellers delivering eggs to the Buyer during the period in which such eggs are stored, all as determined conclusively by the Buyer.

Any losses, after paying all warehousing charges, interest, taxes, insurance and other costs, resulting from the ultimate resale of such eggs by the Buyer shall be chargeable against and be paid by the Sellers proportionately on the value of the respective deliveries of the Sellers delivering eggs to the Buyer during the period in which such eggs are stored, all as determined conclusively by the Buyer.

(d) The Buyer in its discretion may ship any of the eggs delivered hereunder to any market where, in its judgment, fair prices may be obtained therefor.

Any eggs so shipped shall be deemed to have been resold at the current market value on the dates of shipment, as conclusively determined by the Buyer, and the sale price, so calculated, shall be added to the receipts from the eggs actually sold during that week and shall be distributed as part of the weekly receipts as above provided.

Any profits resulting from any of the said operations shall be placed in the general corporate funds, subject to distribution in accordance with the By-Laws of the Buyer.

(e) Any losses resulting from any of the operations in 3 (d) shall be charged against general corporate activities of the Buyer as a necessary commercial overhead expense and the Buyer may, in its discretion, create reserves against such contingenices.

(f) The Buyer may in its discretion sell or consign any of the eggs to hotels, restaurants, retail stores or other large users of eggs and the costs of any such business, as determined conclusively by the Buyer, shall be charged against the proceeds therefrom in addition to the deductions provided in paragraph 2 hereof, before the receipts are mingled with the total weekly receipts for distribution among the Sellers hereunder.

(g) The Seller agrees that the Buyer may handle and market the eggs, some in one way and some in another, all in its sole and exclusive discretion.

(h) The Seller agrees that the Buyer, as the actual owner of the eggs hereunder, may borrow money thereon and exercise any and every right of ownership thereof.

4. (a) The Buyer shall be the sole judge of the standard, quality and grade of the eggs and poultry and shall adopt such method of standardization as will be the most advantageous in general.

(b) The Buyer may make rules and regulations and provide inspectors to standardize the quality method and manner of handling, packing and shipping of eggs and poultry for any purpose; and the seller agrees to observe and perform any such rules and regulations prescribed by the Buyer.

(c) All eggs and poultry delivered to or at the order of the Seller hereunder shall be of the standard and conform to the regulations as to quality and otherwise that may be prescribed by the State and Federal authorities or the Buyer.

(d) Any deduction or allowance or loss or expense that the Buyer in its discretion may make or suffer or incur on account of eggs or poultry of inferior quality or standard or undesirable conditions as determined by the Buyer, shall be charged against the Seller and be deducted from his net returns hereunder.

(e) The Seller expressly agrees that all eggs and poultry delivered hereunder shall be free from damage of any kind and in good marketable and merchantable condition and shall be delivered to the Buyer as, when and where it shall direct.

5. (a) This agreement shall be binding upon the Seller during the term hereof as long as he is a poultry producer or possesses any legal interest in poultry or poultry products and he shall be obligated by all the terms hereof for any eggs and poultry produced or acquired by or for him.

(b) Any transfer of poultry or of poultry farms by the Seller to any relative of any degree or to any person in trust during the term hereof shall be deemed to have been made subject to and conditional upon compliance with all of the terms hereof by any such transferee and such compliance is a continuing obligation of the Seller.

6. The Seller shall have the right to dispose of his poultry at his own discretion until the Buyer, by ten days' notice mailed to him at his last known address, instructs the Seller to deliver all of the poultry that they intend to sell or market in any event, as, when and where and for as long a period only as the Buyer may direct. In the event of such notice, all of the provisions hereof shall be applied to poultry as well as to eggs, excepting that on the resale of poultry, each Seller's deliveries shall be handled separately and the returns shall be made to him individually, less all of the deductions herein provided.

Both parties agree that the Buyer need not market poultry hereunder, unless and until the Buyer, in its discretion, deems it necessary for the protection of the public against manipulation of prices by speculative dealers to handle and market the poultry on the co-operative basis herein set forth for as long a period as the Buyer may deem proper.

7. The Seller shall have the right without charge to use or sell eggs for hatching and hens or pullets for increasing or renewing the flocks and cockerels and cocks for breeding, all subject to such regulations as the Buyer may make.

8. This agreement is one of a series generally similar in terms, comprising, with all such agreements, signed by individual Sellers, one single contract between the Buyer and the said Sellers, mutually and individually obligated under all of the terms thereof, excepting individual withdrawals as provided in paragraph 9. The Buyer shall be deemed to be acting in its own name for and in the interest of all of such Sellers in any action or legal proceeding on or arising out of this contract.

9. This agreement shall continue in full force and effect in and throughout each of the years 1921, 1922 and 1923, respectively, unless the Seller by written notice sent by registered mail to the Buyer between October 1st and October 15th of any year, beginning with 1920, terminates this agreement as to such Seller, as of December 31st of that year.

10. If the Buyer brings any action to enforce any provisions hereof or to secure specific performance hereof or to collect damages of any kind for any breach hereof, the Seller agrees to pay to the Buyer all costs of court, costs for bonds and otherwise, expenses of travel and all expenses arising out of or caused by the litigation and any reasonable attorney's fee expended or incurred by it in any such proceedings, and all such costs and expenses shall be included in the judgment and shall be entitled to the benefit of any lien securing any payment hereunder.

11. The Seller agrees that in the event of a breach by him of any material provision hereof, particularly as to delivery or marketing of any eggs or poultry other than to or through the Buyer, the Buyer shall, upon proper action instituted by it, be entitled to an injunction to prevent further breach hereof and a decree for specific performance hereof, according to the terms of this agreement; and the Buyer and the Seller expressly agree that this agreement is not a contract for personal service or demanding exceptional capacity or talents and that this is a contract for the purchase and sale of personal property under special conditions and circumstances; and that the Buyer limits its purchases of eggs and poultry to producers co-operating with it under this form of contract and can not go out into the open markets and buy eggs or poultry to replace any which the Seller may fail to deliver; and that this contract will be the proper subject for the remedy of specific performance in the event of a breach thereof.

12. Inasmuch as it is now and ever will be impracticable and extremely difficult to determine the actual damage resulting to the Buyer should the Seller fail to deliver to the Buyer all of the eggs and poultry herein agreed to be delivered, the Seller herby agrees to pay to the Buyer seven cents for each dozen eggs and one dollar for each dozen commercial poultry sold, consigned, delivered or marketed by or for him and so undelivered to the Buyer, as liquidated damages for the breach

of this contract in that regard, all parties agreeing that this contract is one of series dependent for its true value upon the adherence of each and all of the contracting parties to each and all of the said contracts.

13. In the event that the Buyer, in the exercise of its contractual rights, purchases all of the capital stock of the Buyer owned by the Seller, thereupon the Seller and the Buyer shall be released and relieved from any and all further obligations under this agreement.

14. The parties expressly agree that there are no oral or other agreements, understandings or conditions between them in addition to those herein set forth that this contract represents the intent of both parties clearly, thoroughly and completely.

READ, CONSIDERED AND SIGNED by the Seller this____________

day of_________________192____, at ____________________, California.

DO NOT SIGN WITHOUT READING. ______________________

Seller.

Number hens in flock____________ Address—Route________Box______

Town_____________________________

By authority of a resolution of the Board of Directors of the Poultry Producers of Central California, Inc., adopted on July 22, 1919, this agreement is approved, accepted and executed.

POULTRY PRODUCERS OF CENTRAL CALIFORNIA, Inc.

San Francisco, Calif.,___________192__ By____________________

POULTRY PRODUCERS OF CENTRAL CALIFORNIA, INC.

Agreement

This Agreement, made between the Poultry Producers of Central California, Inc., a California corporation, organized for the co-operative marketing of poultry and poultry products, hereinafter called the Association, first party, and the undersigned poultry producer, hereinafter called the Producer, second party.

Witnesseth:

Whereas, The said Poultry Producers of Central California, Inc., proposes to increase its capital stock, from the sum of $250,000,000.00 divided into 25,000 shares of the par value of $10.00 each, to $750,000.00 divided into 75,000 shares of the par value of $10.00 each; and

Whereas, The undersigned Producer is a member of the Association and desires to assist the Association in financing its operations,

Now, Therefore, in consideration of similar obligations undertaken by many other poultry producers who are members of the Association, the parties hereto agree:

1. The Producer hereby authorizes the Asssociation to deduct from his weekly egg returns one cent for each dozen of eggs marketed for him from and after the date hereof and during the term of the standard produce sale agreement signed by said Producer; and the Association agrees to credit and apply said deductions in the event said capital stock is increased on the account of the respective Producer toward the purchase of additional shares of capital stock of the Association at par, which the Producer hereby agrees to purchase; and such additional shares shall be delivered to the respective purchasers as and when each is fully paid for; but no such deduction shall be made after the total authorized capital stock of $750,000.00 has been fully paid for.

It is understood that the issuance of any shares of stock of the Association is dependent upon the Association's securing a permit from the Commissioner of Corporations of the State of California, so to do. In the event no such permit is secured by December 31, 1921, then the Association agrees immediately to repay to the Producer the deduction theretofore made from his weekly egg returns.

POULTRY PRODUCERS OF CENTRAL CALIFORNIA, INC.

By____________________________

PRODUCER____________________________

P. O. Address—Route__________Box________

Town_________________

Dated____________________1921.

APPLICATION FOR STOCK

The undersigned hereby applies for and agrees to purchase________ shares of the capital stock of the POULTRY PRODUCERS OF CENTRAL CALIFORNIA, INC., a corporation organized under the laws of the State of California for co-operative marketing of poultry products, at the par value thereof, namely $10.00 per share, payable upon demand.

The undersigned expressly states that he is a poultry producer and that this purchase of stock is at the rate of one (1) share for every thousand or majority fraction of thousand hens owned by him; and that he has executed herewith the standard Produce Sale Agreement with the Corporation for the sale of his poultry products to the said Corporation on a co-operative marketing basis therein set forth.

Dated this____________day of_______________, 192____.

(Name)_______________________

(Address)_____________________

Accepted this__________this day_________________192____.

POULTRY PRODUCERS OF CENTRAL CALIFORNIA, Inc.

By_________________________

ADVANTAGES OF CO-OPERATIVE POULTRY PRODUCING AND MARKETING ASSOCIATIONS

Some of the advantages which members of the Co-operative Poultry Associations will enjoy through the co-operative movement are these:

"1st. All incubating can be done by the Association's Central Incubating Plant, having a capacity large enough to hatch the eggs of all members; scientifically designed and operated by experts. This insures each member against the great losses incident to individual incubation without expert care. The cost of incubating will thus be greatly reduced, and the percentage of healthy chicks increased.

"2nd. The Association can relieve the individual members of the work of selling their produce. Businesslike sales methods, daily collecting and shipping of the eggs, and disposing of them to leading hotels, restaurants, hospitals, institutions, dining cars and fancy grocery stores at fancy prices, which are easily secured for day old eggs, laid by sanitarily housed, grain-fed chickens. Eggs laid by disease infected barnyard hens, scratching their living from a manure pile, really would not come into competition with these eggs.

"3rd. Association's slaughter and dressing of fowls. Packing and shipping broilers and roasters at top prices. This eliminates for the member a very disagreeable part of the business.

"4th. Feathers and offal turned into commercial channels and marketed at ruling prices.

"5th. Low co-operative cost of selling, packing, shipping and collecting, as the expenses of these can be pro-rated among the members according to the value of the produce handled for each individual.

"6th. Standardization of breed, housing, care, feeding, etc. The adoption of improved chicken houses, expert care, scientific feeding.

"7th. Proper feed, bought at car load cost prices; all supplies and equipment, such as fencing and building material, at wholesale prices.

"8th. Frequent inspection of each member's farm, as to care, health and housing of fowls to insure efficiency of each flock, as regards egg production.

"9th. To further the prestige and reputation of eggs and poultry, a trademark can be adopted. Eggs can be marketed in attractive cartons, which can be stamped with the date on which the eggs were laid.

"10th. Members should be required to comply with the rules and regulations of the Association in order that their eggs and poultry may become famous throughout the country, it being to the advantage of all that the name shall be a guarantee of the finest produce of its kind.

"11th. Elimination, in so far as it is humanly possible by experience and knowledge, of all the troubles that beset the individual poultryman, working single handed.

"12th. Each member should have equal rights in the selection of officers and in determining the policies of the Association, as it is his organization. Each member should be entitled to but one vote.

"13th. Monthly meetings for the discussion of conditions in the enterprise, when ideas and suggestions for betterments are considered, and policies adopted.

"14th. Only members are given the service and benefits of the Association."

A WOMEN'S EGG CLUB

Mr. M. E. Bacon is authority for the statement that surrounding Guthrie, Todd County, Kentucky, the farms are well supplied with chickens, and eggs are produced in large quantities. These were sold to the stores in Guthrie, at prices that were uncertain and in summer were very low. The women became dissatisfied and cast about for some relief.

One day, when County Agent G. T. Wyatt was in Guthrie, one of the women asked for a suggestion. His reply was like this: "Why don't you organize an egg club, the same as the farmers organize clubs for various purposes? Sell strictly fresh eggs; grade them rigidly as to size and color; guarantee each one to be all right in every respect. I don't believe you will have any trouble in finding a market at prices well above what you can get here."

The women started to work along the lines suggested. Six women pooled their eggs for the first shipment. Others were interested but uncertain, and wanted to see a test made. When the returns were in the sale showed a net profit of two and a half cents a dozen over the price offered in Guthrie. Then the club membership grew rapidly. At the end of six months there were ninety members, with more applying. In that time the eggs sold amounted to more than $1,300. And so well had the women followed Mr. Wyatt's advice as to quality that not a single claim had been received for an egg broken or stale.

The club is organized as the Guthrie Poultry and Produce Association and on their stationery appears the slogan: "Guaranteed Poultry, Eggs and Produce." So far the activities of the club have been confined to the sale of eggs, but the success there has been so pronounced that the women expect to branch out into furnishing both live and dressed poultry and possibly other farm produce.

In all this the men have played no active part. The women have handled the entire proposition themselves. The eggs are received, graded, packed and shipped by the women, and when the money is received it is paid out by the club officers. The plan is remarkably simple.

The eggs are delivered each Wednesday and Saturday afternoon by the club members to the express office in the depot at Guthrie. For, mind you, the club has no warehouse or place of business, no capital stock and no salaries. A committee of women is always at the express office there to receive the eggs as they are brought in—in every sort of basket, box or other carrier. As each lot of eggs is received it is carefully counted and graded and the number credited. Every egg has to be of full size, of the right color, clean, and laid since the last shipping date. Undersized, off-colored or dirty eggs are promptly rejected and returned to the owner, or sold on the local market.

After acceptance the eggs are wiped off with a damp cloth and packed in ordinary crates holding thirty dozen each. These are shipped the same afternoon. The standard weight of a crate of eggs is fifty-three pounds, but those of the Guthrie women have ranged from fifty-seven to fifty-nine pounds.

The semi-weekly shipments have ranged from something over 400 dozen in the summer, when the hens were laying freely, to ninety dozen early in December.

Prices have netted the club members from ten cents to fourteen cents a dozen more than could have been obtained at home. The first week in December the women were getting the very satisfactory price of fifty cents a dozen.

Originally the idea was to advertise the eggs and sell them in small quantities to individual consumers, shipping by parcel post. But the advertisements brought inquiries from many sources that wanted to contract for the entire lot each time. Among these the application of a fancy grocery "somewhere in Florida" proved to be just what the club was looking for. This grocer was willing to pay the top market price and to take all the eggs that could be shipped to him. He made prompt settlement as soon as the eggs arrived and were counted. To him, the entire lot has been going each shipping day for several months.

For the first six months the only expenses were expressage and a cent a dozen for crates. The receiving committee and officers gave their services absolutely free of charge. But the business has attained such proportions that this year a small fee will be charged against each dozen eggs to pay the workers for their trouble.

THE ORGANIZATION OF BOYS' AND GIRLS' POULTRY CLUBS

The U. S. Dept. of Agriculture has charge of the Boys' and Girls' Poultry Club work, and their suggestions are as follows:

Throughout the year meetings should be held to discuss the different problems of poultry management, and at such meetings the Animal Husbandry Division of the Bureau of Animal Industry, United States Department of Agriculture, will have in attendance, whenever possible, one of its specialists on poultry to assist in solving such questions or problems as might arise and to give whatever help and information he can to the members on such subjects as selection of stock, candling demonstrations, etc. He will also assist in securing first-class markets for the sale of the poultry and eggs.

Each county club should hold an exhibition once a year, preferably in connection with the county fair, at which place a pair of the best chickens grown by each member should be placed on exhibition and entered to compete in the regular classes for premiums offered by the fair association, as well as for the special prizes offered for members of the poultry clubs. An exhibit of the best dozen of eggs should also be made.

It will be well to have a president, one or more vice-presidents, and a secretary.

It is advisable for the teacher in charge to be honorary president of the club.

A simple constitution and by-laws should be adopted. It will be found profitable to subdivide the county organization by townships, schools, or school districts, and have local meetings at schoolhouses or at different members' homes occasionally.

SUGGESTED CONSTITUTION AND BY-LAWS

Article I. This club shall be known as the (insert name of the school district) Boys' and Girls' Poultry Club.

Article II. The objects of the club shall be: (1) To obtain a greater knowledge of the value of raising and breeding standard-bred poultry; (2) to teach better methods of marketing first class poultry and eggs of uniform quality; (3) to learn how to carry on the hatching, rearing, feeding, and housing of poultry.

Article III. Any boy or girl between 10 and 18 years of age can become a member of the club on signing the membership roll and on agreeing to set at least one sitting of 13 eggs during the hatching season.

Article IV. Members shall not pay any dues or assessments.

Article V. Each member must study the instructions sent out by the United States Department of Agricutlure and agree to furnish reports of work when requested to do so.

Article VI. The officers of the club shall be a president, a vice-president, and a secretary.

Article VII. The president or secretary has the right to call a meeting of the club at any time. The annual meeting shall take place as soon after January 1 of each year as possible. The officers for the ensuing year shall be elected at that meeting and shall hold office until their successors are elected.

Article VIII. Each member is expected to exhibit every fall or winter live poultry of his or her own raising and one dozen best table eggs at a county fair or other suitable place. They can compete for the regular premiums offered by the fair association, as well as for the special prizes offered to the members of the club.

Article IX. All prizes on live poultry must be decided in accordance with the standards of the breeds in the American Standard of Perfection, published by the American Poultry Association.

PRIZES AND AWARDS

The award of prizes on fowls and eggs shall be made according to the rules published by the American Poultry Association.

It will be found best to distribute the prizes as widely as possible. Honor and recognition sometimes count for more than money. Badges, certificates and diplomas given to the club members are often more appreciated than money and expensive premiums. The same badge or emblem used by canning club members will be used by members of the poultry club. When liberal amounts are offered for prizes, it will be well to give them in every township or school district, and offer premiums to the club that will make the highest records with 5 or 10 in a team, dividing this premium into several different awards, depending upon the rank.

FOUR YEARS' WORK FOR POULTRY CLUBS

First Year

Each member shall set at least three sittings of eggs from pure-bred stock, and raise seven pullets and one cockerel. All hatching must be completed by May 15. A composition on poultry management must be submitted to the agent in charge of the club work. Accurate records are also to be kept and sent to the above mentioned official, and all meetings of the poultry club must be attended.

Second Year

Each member shall set at least three sittings of eggs from pure-bred stock, and raise seven pullets and one cockerel. All hatching must be completed by May 10. A pair of birds and one dozen eggs from this stock shall be exhibited at the County or State fair. A composition on some phase of poultry work shall be submitted to the agent in charge of the club work. Accurate records are also to be kept and sent to the above mentioned official, and all meetings of the poultry club must be attended.

Third Year

Each member shall raise at least 25 pure-bred pullets and 2 cockerels. All hatching must be completed by May 1. A pair of birds and one dozen eggs from this stock shall be exhibited at the County or State fair. A composition on some phase of poultry work shall be submitted to the agent in charge of the club work. Accurate records are also to be kept and sent to the above mentioned official, and all meetings of the poultry club must be attended.

Fourth Year

Each member shall raise at least 30 pure-bred pullets and 3 cockerels. All hatching must be completed by May 1. A pair of birds and one dozen eggs from this stock shall be exhibited at the County or State fair. A composition on some phase of poultry work shall be submitted to the agent in charge of the club work. Accurate records are also to be kept and sent to the above mentioned official, and all meetings of the poultry club must be attended.

The hatching and rearing of the chickens; the condition of chickens and cleanliness of coops and poultry buildings; the cost of producing eggs; accuracy and neatness of records; attendance at meetings; exhibits at the fairs; and written articles on poultry work shall be considered in rating members and awarding prizes.

Poultry Associations

Suggestions for Organization and Conduct of Poultry Exhibits

THE VALUE OF POULTRY SHOWS AND ASSOCIATIONS

In the early history of the Standard-bred poultry industry the organization of poultry associations and the holding of small shows was largely responsible for placing the industry upon the solid foundation on which it rests today. These prior organizations were fathered and supported by the "Grand Old-timers," who in reality were responsible for the poultry industry as we find it at the present time. They were often humiliated by being called "poultry cranks"; though today the financial importance of the poultry industry in every state in the Union shows that these old-timers built much better than they knew. At the beginning the Standard-bred poultry industry was a fad of the fanciers, so to speak, yet the fanciers, associations and exhibitions multiplying and gaining in importance year after year have resulted in the growth and development of a wonderful industry, the importance and magnitude of which begins to startle the world by its constantly and rapidly increasing immensity.

The interest, enthusiasm, and the demand for knowledge which was created by these small towns and associations has been responsible for the establishment of poultry departments in colleges of agriculture, together with experimental stations and extension departments here. It is a conceded fact that in many communities where we find a well conducted poultry show or a properly organized and enthusiastic association, even though they be very small ones, the poultry industry in that section is of greater proportions than in communities where such a show or association does not exist. Farmers and town people are attracted to poultry shows, where they meet more experienced breeders and where they can see and talk over progress that has been made in breeding for shape, size, color, and egg production. It is a meeting place for poultry breeders; they study each other's methods; they associate ideas and profit much by observation and communication. One of the greatest and most important influences toward better and more Standard-bred poultry are monthly meetings held by poultry associations for the purpose of discussing various phases of practical methods and questions pertaining to poultry breeding and work. The good which is done and can be done as a result of such work on the part of poultry associations is beyond estimation.

Some poultry shows and associations, like business firms, live to a ripe age, while others die in infancy. In every state we can find an association which has been in existence for a number of years and holding a successful show each year, which is a financial success. In the same state we find another association which makes a flattering beginning, but within a year or two it becomes disorganized and is no longer heard from. Such shows are held at a loss and the members become dissatisfied. These conditions are generally brought about by improper organization. Appreciating the good and valuable work that may result from a properly organized poultry association, it is the purpose of this lesson to show how to avoid many mistakes commonly made and to offer suggestions which should aid in the organization, encouragement and strengthening of poultry associations and the holding of an annual poultry exhibition.

A Poultry Association and a Demonstration in Judging Poultry

HOW TO PROCEED TO ORGANIZE

Many counties and cities fail to have a good poultry organization because they do not know just how to proceed to organize; or for the lack of sufficient encouragement, there is no one who cares to attempt it alone.

One of the first things that should be done, even before attempting to organize, is to write one or more articles for your local daily, weekly and county papers. The first article should point out the value and importance of the industry to the state. The second should deal with the importance of the industry to your county and, if possible, mention certain cases where you know farmers or poultry raisers have done well with poultry, or other specific facts about poultry raising in your own county. The third might deal with the advantages of a good live poultry organiation in your community or city, and the benefits to be derived from same. In this article you might also call a meeting of those interested in holding a poultry show or in forming a good live association, to meet at the city hall, opera house, or some other public place which is centrally located. Make plain the date, the hour and the place. Invite and urge the attendance of all who are in any way interested. It would also be a good idea to post public notices, write postals, or send out a circular letter to a few of those whom you think would most likely be interested in the proposition, and urge them to come and co-operate. It is often a good idea to have two or three papers prepared and read, a talk made or a little entertainment provided.

Such methods as the above usually bring at least a few people. You can then proceed with the organization. Elect a temporary president and secretary, and the permanent officers can be elected after those present have been given an opportunity to state their views as to the advisability of an association, its purpose and its extent.

In organizing we suggest that you not only elect a president, vice-president, secretary-treasurer, and an executive board, but you will make no mistake if you should elect a vice-president from each township in the county. These people, if they are the right sort, will strengthen your organization and add new members from every portion of the community which you desire to cover. You will find, as a rule, that three or four poultrymen have to carry the burden and be reponsible for the success of the show or the association for a greater portion of the year. So do not be discouraged if everybody does not fall in line from the very start or should fail to give you the help you really deserve. Also, bear in mind there are always some knockers.

SUGGESTIONS FOR CONSTITUTION AND BY-LAWS FOR COUNTY POULTRY ASSOCIATIONS

ARTICLE I

The name of this organization shall be the____ Poultry Association.

ARTICLE II

The object of this association is to promote the poultry industry in all its branches, to encourage the breeding of pure-bred poultry, to hold one annual poultry show, to co-operate with the State Poultry Association and with all other institutions or associations in the state that are in any way trying to encourage the production of more poultry and eggs and the improvement of the quality of same.

ARTICLE III

MEMBERSHIP.

Section 1. All members in the association shall be active members.

Section 2. Any person of good character and reputation may become an active member of the association. Application shall be made to the Secretary-Treasurer and must be accompanied by the membership fee for one year.

Section 3. Membership shall be acknowledged by the Association Membership Card, and shall date from the time of such acknowledgement, terminating one year from that date.

Section 4. The annual dues shall be one dollar ($1.00), 50c to pay your membership in this association, and 50c to pay for membership in the State Poultry Association.

Section 5. A payment of $10.00 at any time, shall entitle any member to a life membership without additional fee, subject to explusion as provided.

Section 6. Charges of misconduct of a member shall be made in writing to the Secretary-Treasurer or President; the Executive Committee shall consider these charges together with the defense of the member, and the said Committee may, on a majority vote, suspend or expel the member.

Section 7. An expelled or suspended member may appeal from the decision of the Executive Committee and the matter shall then be submitted to the vote of the Association members. Unless the majority of the members voting shall reverse the decision of the Executive Committee, an expelled member shall be ineligible for future membership in the Association. If the expelled member is a "life member" the Association will deduct the annual dues per year for the actual term of membership and refund the balance.

Section 8. Members may resign by giving notice to the Secretary in writing; but no resignation shall be accepted if the member be in arrears for dues or if there be any charges pending against him.

ARTICLE IV

Section 1. The officers of this Association shall consist of a President, a Vice-President, a Secretary-Treasurer, a District Vice-President in each township, having membership in the Association, and an Executive Committee, consisting of the President, Secretary, and five members to be elected annually.

Section 2. The general supervision and conduct of the affairs of the Association shall be vested in the Executive Committee, when the Association is not in session.

Section 3. The Executive Committee shall carry out the instructions of the Association, shall authorize expenditures (but no expenditures shall be authorized beyond the assets of the Association), shall devise means to carry out the objects of the Association, shall make such rules as may be deemed necessary during the year for the conduct of meetings, the awarding of prizes, etc., and shall perform such other duties as are delegated to it by the By-Laws. They shall fill vacancies in office.

Section 4. The President shall carry out the instructions of the Board, shall approve proper and authorized claims against the Association, shall preside at such general meetings as he may attend, and shall perform such other duties as are herein provided, or such as are customary to the office and not herein otherwise delegated. The Vice-President shall act in the absence of the President.

Sction 5. The Secretary-Treasurer shall, as Secretary, conduct the general correspondence and keep the records of the Association. He shall, as Treasurer, collect all money due, and shall pay from the funds of the Association such claims as are properly authorized and approved. He shall furnish a bond covering the maximum assets of the Association, the premium on said bond to be paid by the Association. He shall keep an accurate record of all money received and paid out and make an annual report to the Association and open his books to the inspection of the Executive Committee when requested.

Section 6. The general supervision of the interests of the Association in any district shall be vested in the District Vice-President who resides in that township. He shall solicit members and carry out the wishes of the Executive Board.

ARTICLE V

In the election of officers all votes shall be taken by ballot, unless the members vote to suspend the rules. Voting on other propositions may be done in such manner as the Association thinks best. No proxies can be voted at any meeting of the Association.

ARTICLE VI

Unless otherwise provided, the President shall appoint Committees to prepare for and handle any special matter, meeting, event or action.

ARTICLE VII

MEETINGS.

Section 1. Annual meetings of the Association shall be held in connection with the annual poultry show. The election of officers shall take place at this time, and such other business shall be transacted as seems for the best interest of the Association. Seven members shall constitute a quorum at an annual or business meeting.

Section 2. Monthly meetings of the Association shall be held at such time and place as the Executive Board may determnie. Notices of such meetings shall be mailed to each member at least three days before the date of meeting. A program committee shall provide for papers, lectures, demonstrations, music, entertainments, refreshments, or such educational features as they deem best for the benefit and instruction of the members. Business matters may be transacted at each monthly meeting, provided there is a quorum present.

Section 3. Special meetings may be called by the President or must be called by him upon the written request of seven members. If any matters of importance are to be transacted at such meetings, the membership must be given due notice of same.

ARTICLE VIII

Any member in arrears for annual dues is hereby suspended, and can only be restored by full payment and a vote of the Executive Committee. Any member proven guilty of dishonesty in his dealings, thereby forfeits his membership.

ARTICLE IX

Any member of the Association found guilty of fraud or dishonorable conduct, shall be suspended from membership for such time as the Association shall decide, or be expelled from the Association by a two-thirds vote of those present at any regular meeting.

ARTICLE X

ORDER OF BUSINESS.

1. Roll Call.
2. Reading unapproved minutes of previous meeting.

3. Election of new members.
4. Reading of communications.
5. Unfinished business and reports of committees.
6. New business.
7. Monthly program.
8. Adjournment.

ARTICLE XI

This constitution and by-laws may be altered or amended by a three-fourths vote at the annual meeting, or by the same vote at a monthly or special meeting, providing the membership has been given notice of the proposed changes.

SHOW RULES OF THE AMERICAN POULTRY ASSOCIATION

All shows that are members of the American Poultry Association are compelled to hold their shows under their rules if they expect to lay claim to any of the diplomas or medals offered by that Association. The Association must print these rules in their premium list or on the back of their entry blank. The rules are as follows:

Section 1. Under normal conditions entries shall close the day advertised (entries bearing postmark of that date being eligible and entry fees must be paid on or before that time, except when telegraphed, and in such cases remittance must follow by first mail.

Section 2. Any person under disqualification by the American Poultry Association is ineligible to enter, to compete, or to act as judge or in any other capacity.

Section 3. All entries must be the bona fide property of the exhibitor. Otherwise, he forfeits all entry fees, all prize money and all other premiums, as well as the right to have his birds remain in the show room. In cases of disqualification under this rule other exhibits shall, if qualified, be moved up in the list of winners subject to the disqualified exhibitor's right of appeal.

Section 4. In cases where it shall come to the knowledge of the management that disqualified parties have, unknown to them, succeeded in making an entry or entries, the right is reserved to cancel such entries, and such party shall forfeit his entry fee, prize money and other premiums.

The Show Management reserves the right to refuse entries from exhibitors whose conduct, in their opinion, makes it desirable for the welfare of the show that their birds be debarred from competition.

Section 5. In cases where entries are made at shows where catalogs are issued and exhibits are not sent, entry fees will not be returned. Associations that do not issue catalogs may use their discretion in this matter.

Section 6. Exhibitors attempting to interfere with or influence the judge or judges shall be dealt with as provided in Section 3.

Section 7. Judges shall be required to sign the judge's book or card provided by the Show Association. An official record of these awards shall be preserved by the Secretary for reference for a term of three years.

Section 8. No specimen shall be removed from the show until after it closes, except upon the written consent of the show Secretary or Superintendent.

Section 9. All entries are entered and shown at the risk of owners, and while associations are expected to exercise all reasonable care in the handling and protection of the exhibits, such associations will in no case be liable except as provided in Rule 10.

Section 10. Birds must be returned promptly at the close of the show, and any lost in the re-shipping, through proven carelessness or negligence on the part of the show association, are to be paid for by such association at a value not to exceed $10 per bird, as agreed liquidation damages, it being understood that in subscribing to this rule the exhibitor does not waive any rights he may have at law.

Section 11. Any exhibitor disqualified for fraudulent practices shall have the right of appeal to the Executive Board of the American Poultry Association within one year from the date of his qualification.

Section 12. Notice of a disqualification with a detailed statement shall be mailed, by the show association, within ten days, to the Secretary of the American Poultry Association and by registered mail to the disqualified party.

Section 13. In case of palpable error, or alleged fraudulent practice on the part of any judge, any exhibitor shall have the right within twelve hours after the awards are posted to make written protest, accompanied by such a deposit of money as the poultry association shall prescribe. The protest shall be passed upon by a committee of three, which shall consist of a representative of the show association, a poultry judge, and a disinterested exhibitor, and if sustained the money shall be refunded.

Section 14. Notice of protests that are sustained shall be mailed within ten days to the Secretary of the American Poultry Association, to be brought by him before the Executive Board, before whom an appeal may be taken by the judge within one year.

Section 15. No judge shall exhibit in any class which he is judging and he shall refuse to consider any bird that he may recognize as having been owned by him six months previous to the show, and no exhibitor or anyone interested in any exhibit that may be in the class shall act as assistant to the judge.

Section 16. Associations shall have the right to re-assign judges for cause or add to the list of judges as occasion may require.

Section 17. The placing of names, leg bands or marks of any sort, not provided by the show, on birds, or either on or in the coops shall be left to the rules of the Show Associations.

Section 18. Show managements shall have the right to refuse entry to the show room, or to remove from the same all diseased or unsightly birds, and are expected to avail themselves of this right. Entry fees on such birds shall be forfeited.

Section 19. All speciments must be exhibited in their natural condition with the exception of Games and Game Bantams. Any violation of this rule shall exclude such specimens from competition and cause the withholding of all premiums awarded.

Section 20. Any matter not provided for in the foregoing rules and regulations will be referred to the Executive Committee of the local show for decision.

Section 21. Where Standard Varieties of poultry that require the Double Mating System are exhibited, local associations are permitted to offer special prizes only for both single entries and pens containing specimens bred in accordance with the system of Double Mating practiced in such varieties. These specials must be plainly designated "Special Prizes," so as to be distinguished from the regular premiums offered for Standard awards.

Section 22. Every exhibitor hereby agrees to submit to the jurisdiction of the American Poultry Association and to abide by these rules, whether or not he is a member of the Association.

Section 23. Any Show Association may make additional rules or regulations provided they are not inconsistent with or in conflict with these rules.

Section 24. All Poultry Associations that are members of the American Poultry Association, shall be permitted to designate their exhibition as official poultry show, and to use the official entry blanks, judges' cards, ribbons, and other supplies furnished by the American Poultry Association.

Section 25. These show rules are official and are copyrighted, and can be used only by Poultry Associations or Societies that are associate members of the American Poultry Association.

Section 26. Local associations must offer premiums in all varieties of Standard-bred fowls.

Section 27. Special awards on sweepstakes shall be made on points; first prize to count 6; second, 4; third, 3; fourth, 2; and fifth, 1; pens to count double. The total number of points won by an exhibitor to be mutiplied by the number of birds exhibited in this variety; this grand total to be the number of points counted in the competition.

These show rules are copyrighted and are for the exclusive use of members of the American Poultry Association.

RULES AND REGULATIONS FOR POULTRY SHOWS

In order for poultry associations to avoid some trouble which might arise during their shows, and in order to meet local conditions which may exist, it is often necessary to have some rules and regulations in addition to those offered by the American Poultry Association. We simply offer a few suggestive rules below and they can be altered to suit local conditions.

These Rules and Regulations should be read and then re-read by all prospective exhibitors.

1. A square deal—the Golden Rule applies to all.

2. This show will be governed by and run under the latest revised poultry show rules of the American Poultry Association and all prizes will be awarded strictly according to the American Standard of Perfection.

3. This show is to be judged by the comparison method (or score card), but a statement will be mailed to each exhibitor showing the band numbers of each bird that won, showing all disqualified birds and what they were disqualified for.

4. Remember! Remember! That the entries close at midnight (on such date as your association determines). All entries are made and accepted in accordance with the rules of this association as herewith printed. Entries should be made upon the blanks furnished by this association, but may be made by letter, by telephone, or in person, providing the entry fees are paid in full before the judging shall have commenced. In all cases the name of the variety, number of specimens, leg band numbers, and the classes in which they are to compete, together with the name and address of the exhibitor, must be plainly stated.

Note: The cock class contains male birds over one year old; the cockerels class contains male birds under one year old. The hen class contains females over one year old; the pullet class contains females under one year old. The pen class contains one male and four females, either old or young.

5. All entries must be the bona fide property of the exhibitor and should this rule be violated the exhibitor shall forfeit all entry fees, together with all prizes, which may have been awarded.

6. All entries are entered and shown at the risk of the exhibitor. This association will exercise every reasonable care in the handling and protection of all exhibits.

7. This association will, without extra charge, provide care, feed, and water to all exhibits intrusted to its care.

8. Specimens must be in the show room by midnight on such date as your association may desire and will not be received later, unless it can be shown that they were unavoidably delayed and then it is at the option of the show officers.

9. No specimen shall be removed from the show room until the close of the show except upon a written order of the secretary. Birds showing signs of disease will be excluded from the show room and returned as promptly as possible to the owner.

10. Exhibitors need not accompany their birds, but they may be sent (charges prepaid in full by the exhibitor) directed to the superintendent of the poultry show, and he will see that they are given the best of care and attention and at the close of the show they will be returned to their owner or disposed of as he may direct.

11. Exhibitors must ship their birds in exhibition coops furnished by themselves. Such coops should be thirty inches high and twenty-four inches square for birds entered in single classes, and should be twenty-four inches deep, thirty-six inches long, and thirty inches high for exhibition pens. A door must be placed in the front of each coop.

(Note to Officers: In case your association should own or rent sufficient exhibition coops to furnish all coops uniform and free to the exhibitors we then suggest that the above Rule 11 be eliminated and the following rule used as Rule 11.)

This association will furnish modern uniform exhibition coops, free of charge, for each exhibitor. In shipping birds to this show do not ship two cocks or cockerels together in the same coop. After being separated all week in the show room they will fight, injure, and often kill one another on their return trip home. Ship your birds in light-weight, yet substantial coops. Do not ship but one variety in a coop.

12. Each variety must be shipped in a coop by themselves. If anyone sends two varieties in the same coop the birds will be refused admittance to the show.

13. The superintendent and assistants will have charge of the cooping and placing of all exhibits. No exhibitor will be allowed to handle his birds at this time without the consent of the superintendent.

14. No birds will be allowed in the show room, except those which have been regularly entered or for which display space has been arranged.

15. No one shall handle another's birds without permission.

16. No exhibitor will be allowed to advertise on coops other than his own. Neither shall any exhibitor place any ribbons on his coops other than those won at this exhibit this year. Ribbons won at previous years' exhibits of any association may be displayed by attaching same to a banner.

17. Competition in regular classes is open to the world. Poultrymen in neighboring counties and states are especially invited to exhibit with us.

18. A shipping tag will be mailed for each entry as promptly as possible, but should same not be received in time, birds should be shipped anyway and duplicate ones will be made on arrival of birds at the show room.

19. All birds must be leg banded and the number of each stated in entry blank.

20. **Use our shipping tags** and entry blanks to avoid mistakes. If you need more, ask for them.

21. **Every exhibitor will be treated alike.** Let's unite our efforts in making this a great and profitable meeting, a grand and successful exhibition.

22. All matters not provided for in the foregoing rules and regulations will be referred to the executive board of this association for decision.

23. Special awards or sweepstakes shall be awarded by the point system, as follows: A first prize to count six points, a second prize four points, a third prize three points, a fourth prize two points, and a fifth prize one point—points won on exhibition pens to count double. The total number of points won by an exhibitor shall be multiplied by the number of birds in his variety. This grand total to be the number of points counted for an exhibitor and the sweepstake prizes awarded accordingly. Special prizes on display for any one variety shall be awarded as follows:

"Special for best display of any one variety shall be made on points: First prize to count five; second, four; third, three; fourth, two; and fifth, one; pens to count double. If more than five awards are placed in any class all places below fifth shall receive one point for each such awards in the single classes and two points for pens.

24. Protests are to be entertained by this association only in cases of apparent dishonesty, ignorance, or carelessness on the part of the judge. In scoring the specimens in dispute, the judge, together with the president and secretary of the local association (or representative appointed by the management of the local association), shall constitute a committee of three and the majority decision of this committee shall be final. Score cards made out by the judge in deciding protested awards are to be retained by the assocation. When protests are entertained, where the judging has been done by score card, the specimens under dispute shall be rescored by the judge, he to act as a member of the committee of three, as provided, the scoring to be done in the presence of the other two members of the committee on protests.

Protests are not to be entertained except when made in writing and the person making same shall deposit with the secretry of the association the sum of five ($5.00) dollars. This money to be returned to the person making the protest if his protest is sustained. If protest be not sustained, the deposit becomes the property of the association.

ENTRY FEE

Entry fee for poultry in single class is 25c per bird.

Entry fee for breeding pens, consisting of one male and four females of same variety, is $1.00 per pen.

Birds entered in single pens class can or cannot compete in the breeding pens, just as the association may determine.

Cash prizes, open to the competition of the world, will be paid as follows, on all varieties:

PRIZES

SINGLE BIRDS

First premium	$1.00
Second premium	1.00
Third premium	Ribbon
Fourth premium	Ribbon
Fifth premium	Ribbon

PEN CLASS

First premium	$2.00
Second premium	1.00
Third premium	Ribbon
Fourth premium	Ribbon
Fifth premium	Ribbon

The association does not feel justified in paying the above liberal cash premiums and then offer all the specials that they do unless there is fair competition, and, therefore, it adopts the following rules:

Six or more entries—all money will be paid.

If there are less than six entries and as many as four, they will award all ribbons, but pay only one-half of the regular cash prizes on both pens and singles.

Beautiful American Poultry Association silk ribbons are used to distinguish each premium. The ribbons and premiums won at a show like this are more valuable to any exhibitor than the mere cash prizes, however large they might be.

The same premiums will be paid on Turkeys, Ducks, Geese and Bantams as stated above, and the same rules apply.

SPECIAL PREMIUMS

Every association should appoint a committee to solicit a creditable list of cash and merchandise specials, silver cups and other prizes from their members and the business men of the city in which the show is to be held. These should be offered only to members of your association and increase your membership in that way.

ADVERTISING IN PREMIUM LIST

Another committee should be appointed on advertising. They should solicit ads from the business men and the poultrymen who have stock and eggs for sale. In this way you can usually raise sufficient money to pay for the printing of the premium list and the cost of the poultry judge. If there is a live commercial club in the city, they should be asked to co-operate and, if possible, make some contribution to the success of the association and show.

ENTRY FEES AND CLASSES

It is almost impossible to conduct even the smallest show on less entry fee than 25c per bird and $1.00 per pen of four females and one male. In order to get a bird scored or to have it judged in comparison with other birds, any breeder should not refuse to pay an entry fee of 25c or more at even the smaller shows. It requires even a larger fee than that to make most shows pay expenses, unless they receive considerable financial backing from the business men of the community. Many shows make the mistake of charging too small an entry fee, and as a result haven't sufficient money to pay their prizes and expenses, and the show and the management are in bad repute and the organization disbands.

Many shows also make a mistake by not requiring a certain number of birds to fill a class. If you require eight cocks, hens, cockerels or pullets to fill a class and you charge a 25c entry fee, this makes $2.00 that the association receives in entry money. If you pay $1.00 for first, 50c for second, and ribbons for third, fourth and fifth, this leaves 50c to pay the running expenses of the show; but if you only require two entries to fill a class you only get 50c in entry fees, and you pay $1.00 for first and 50c for second; you then pay in premiums $1.00 more than you received. The show is held for the benefit of the exhibitor. He has reaped the benefit of the winning and in addition has received more money than he paid out, and your association is in debt and perhaps wrecked. Breeders should not object to paying a reasonable entry fee, nor should they complain if a reasonable number of birds are required to fill a class. An association that does not take these precautions is short lived, unless it gets its support from outside sources.

LARGE OR SMALL PRIZES

Very few associations pay their officers anything for their services. It is chiefly a labor of love. Then why should any set of officers be called upon to pay such large prizes that the show proves a financial failure? Many associations make the mistake of offering larger prizes than their entry fee will justify. Take the precaution to so regulate your premiums, your entry fee, and your requirements for filling classes that the entry fee will pay all regular premiums for that class and give you a little surplus to meet your incidental expenses. It is better to have a few less birds and be able to meet all your obligations, than it is to have a much larger show and not be able to pay half you promised and have everybody sore. This is a common mistake which has wrecked many a poultry association that started under the most favorable conditions. If you are wise, you will profit by your wisdom.

VALUE OF SPECIAL PRIZES AND THE PROPER METHOD OF AWARDING SAME

By offering an attractive list of special prizes any association may be able to interest a large number of exhibitors in its show without the necessity of paying such large regular prizes as to bring financial loss. These prizes may be solicited from the business men and the members of the association. Every association should have a committee appointed for that purpose. These special prizes should consist of cash, silver cups, merchandise, and prizes that have both real value and drawing power.

It is usually best to open the special prizes to members of your own association. The regular prizes should be open to the world, as you are charging an entry fee to compete for these, but your specials should, in most cases, be open only to members of the association. This will increase your membership and bring in more revenue, to which you are entitled.

A very good method of awarding special prizes for the largest and best display of any variety is by points, as follows:

In all single classes the prizes are to count as follows: Each first prize counts 5 points; second prize, 4 points; third prize, 3 points; fourth prize, 2 points; fifth prize, 1 point; and one-half point for each additional bird entered which is not disqualified. Pen winnings are to count for double the number of points allowed for single birds. The exhibitor whose points total the greatest number is entitled to the prize for the largest and best display.

ATTRACTIVE SHOW ROOMS

In the first place, the show room should be conveniently located so that your show may be put in close proximity to the people, and be well attended. The room should be well lighted, both day and night. If the room is dingy and dirty, it should be cleaned up and made as attractive as possible. A little decoration will often add much to the attractiveness of the show room. Use a few plants, a little bunting or flags, and some colored cheese cloth for decoration. Debar all unsightly coops. Keep the floor swept and the room clean and attractive so your show will be the talk of the town.

ENLIST HELP OF BUSINESS MEN

If the benefits of a poultry show and the importance of the poultry industry are properly presented to the commercial clubs and merchants of any city, it is not a difficult matter to enlist their help and co-operation. They will often give specials or agree to put on special sales each day during the show. Sometimes it is best to get one merchant to have a sale on one article during the week, another merchant to have a sale on another article in his line, and so on through the entire list of merchants. Get them to advertise these and to decorate their show windows appropriately for the week. On Saturday, or the closing day of the show, it is a good idea to give away several hundred pounds of candy to school children, especially from country districts. Other events may be put on at a small cost to the business men, and these propositions should be put up to them and their help enlisted. They will profit by it and so will your show.

IMPORTANCE OF EGG SHOWS

The egg business is the most important branch of the poultry industry. The revenue from the sale of eggs exceeds that from the sale of poultry by several million dollars. The loss from bad eggs is tremendous. An egg exhibit is an attractive feature of any poultry show, and the shows which have not attempted same are neglecting an important feature and an opportunity to do the industry a great amount of good.

Arrange the exhibit in such a way that it will be attractive. Put on special features in connection with it. Have a display from all varieties. Have each labeled. Have a display of good eggs and bad eggs, clean eggs and dirty eggs, large eggs and small eggs, thin shelled eggs and perfect shelled eggs. Have each appropriately labeled.

Every show should have an expert to candle some of the eggs at a certain hour each afternoon and night. This expert should be able to demonstrate the various defects found in eggs, giving the reasons for same and showing how this loss can be avoided. If properly advertised and arranged, the exhibit of eggs can be made an attractive feature and one of great educational value to any show.

Score cards and instructions for judging eggs are now issued by the American Poultry Association, and these can be obtained from the secretary.

LECTURES, DEMONSTRATIONS AND EDUCATIONAL EXHIBITS

Every poultry association should make its educational features one of its greatest attractions for both members and visitors. If some good does not result, if some advancement is not made in methods of breeding, care and management, if the poultry industry is not elevated and uplifted by the work done by an association of poultrymen, then that organization is scarcely worth while.

Poultry associations desiring lectures, demonstrations or exhibits must provide a suitable room or space for same. Never ask a lecturer to talk in a show room in opposition to the noise and confusion. Never ask for either of these unless you intend to see that the meetings are well advertised. It costs a great deal to send men about the state, and if some other association is turned down in order to accommodate you, your association should at least see that a crowd is present and the lecturer is not compelled to talk to empty benches. Your agricultural college will always be glad to help with this work when their finances will permit and they have the men and exhibits to supply.

SUGGESTIONS TO THE SECRETARY

The greater part of the success of the average poultry show is due to the efficiency of the secretry. With him rests the responsibility for creating the show. One of his first duties should be to prepare a mailing list of all the fanciers in the county, together with the names and addresses of such fanciers in the territory from which the association expects to draw its entries, and each of the names on this list should be advised in regard to your show by circular letter and announcements in the papers of your county as well as in the poultry papers. The first thing in order should be the selection of dates, first ascertaining whether there are any associations in close proximity which are intending to hold a show and if so on what dates said shows are to be held, so that a selection of dates may be made that will not conflict with shows that have already announced their dates. It is advisable and more satisfactory to select your judge before announcing your dates as it is not always possible to secure a competent judge upon the dates you may desire and you will, therefore, of necessity be required to hold your show on such dates as the judge selected may be able to give you.

To successfully conduct your show certain regulation supplies will be necessary, the most important of which will be neatly printed stationery, a premium list, entry blanks, entry tags, shipping tags, admission tickets, memberhsip tickets, score cards, and the minute book, as well as one of the improved record books by which every entry can be recorded, including the record of all prizes, regular and special, that are made at your show. The premium list should be neatly printed and should contain rules and regulations, all information in regard to regular premiums which you intend to offer, together with all special premiums and any other information which your association desires to publish in the interest of your show. In order to make your premium list self-supporting it is advisable to sell advertising space to the breeders and merchants of your county. The size and number of pages will depend upon the amount of space to be used in the interest of your show and the amount of advertising space you may sell. The customary side of the pages of the model premium list is 6x9 inches. Your local printer should be consulted and he will be pleased to assist you in preparing a dummy and will submit a price for the printing of same in such lots as may be desired. This estimate should include the furnishing and printing of a sufficient number of envelopes to mail out as many premium lists as you may desire to use. After securing your printer's estimate you can then determine the selling price of advertising by the page, half page and quarter page, establishing a price so that a reasonable profit shall be made for the benefit of your association.

It will also be necessary to secure regulation entry blanks so that one may be sent with each premium list and enough remain on hand to care for contingency. If your show is to be judged by the score card method it will be necessary to secure in advance a sufficient quantity of score cards so that the judge may use one for each entry in your show, and if your show is to be judged by the comparison method it is advisable to secure a number of judges' cards so that a proper record of awards may be made in the record book of the association.

A record book is indispensable. With one of these books it is possible to have a complete record as follows: Name and address of each exhibitor, together with his entry number, class, and sex of each bird, band number, weight, score and all prizes awarded; also a complete financial report of all moneys received for entry fees, as well as moneys paid out for prizes. Such a book will last the average show for years.

It is also necessary to have a small entry card for each specimen, to be attached on the coop. This card should contain the following information: variety, sex, weight, entry number, and band number. This card may be a separate card or made in combination with the score card.

In order to keep a proper record of your door receipts it is advisable to have a sufficient quantity of single admission tickets to care for each day's attendance.

Gummed stickers designating first, second, third awards, etc., can be secured from the secretary of the American Poultry Association and should be used to place on the coops containing the winning birds instead of the actual ribbon, as very often the ribbons become soiled or are lost from the coops.

Award ribbons can be secured from the American Poultry Association. Ribbons should never be placed on the coops by the association, but should be handed by the secretary to the winner of same if he is present in the show. Otherwise, it is best to mail the ribbons together with the premium check and the award report sheet by first class mail to the exhibitor.

The secretary should purchase a substantial book in which should be kept the minutes of the meetings, together with an accurate system of accounting for all cash received and expended. This book should also contain the official record of the constitution and by-laws.

The secretary should cordially remind the chairman of the committee on special premiums of the fact that it is his duty to have on hand as many of the special premiums as possible at the beginning of the show. They can usually be displayed in some manner to the advantage of the association. In case a few nice silver cups are offered as special prizes it often proves a good advertisement to arrange for their display during the week previous to the show and during a portion of the show period in a well decorated window of one of the leading stores of the city.

It should always be uppermost in the mind of the secretary that he owes a duty to each and every exhibitor. He should extend them every service possible. He should take pride in completing his work as secretary, getting his records in such shape that he can deliver the premium checks, ribbons, and the report of awards to each exhibitor at the earliest date possible.

SUGGESTIONS TO SUPERINTENDENTS

In order that your exhibit may show to the best advantage, it is advisable that coops shall be placed in the show hall in such a manner that all birds of the same variety shall be exhibited in coops by the side of each other. This expedites the work of the judge and permits the visitors to more easily compare the qualities of the winning birds.

It should be a part of the superintendent's duty, assisted by a disinterested committee, to see that all birds are carefully and correctly weighed and such weights correctly marked on an individual entry tag for each bird, which should be tacked onto the exhibition coop containing the bird. Said tag should also contain the entry and leg band numbers of the fowl. The superintendent should see that all birds are properly fed and watered at least one hour before being weighed. He should properly feed and water all birds during the exhibit and at the expiration of the show should see that all birds are properly fed and all coops provided with ample dry straw just prior to their homeward journey.

He should adopt regular days and hours for the thorough cleaning and rebedding of all exhibits, special care being taken to disturb the birds as little as possible in doing so.

In order that your show hall may be patronized by the best people of your community the superintendent should keep the hall, the floors, and exhibits in a neat, tidy, and sanitary condition and appearance.

Feed all fowls plentifully, but do not overfeed. Sharp grit and oyster shell should be supplied all birds once during the week.

Water the fowls morning and afternoon, care being taken not to slop water onto the floor of the coops. This often causes stained and unsightly plumage.

HINTS TO OFFICERS IN GENERAL

The "Golden Rule" should be the guide for the officers of every poultry show, club or association. Many good associations are ruined because of a jealous spirit arising. Some sets of officers attempt to run their show solely for their own profit and good. Whenever such is attempted it is a question of only a short time until dissension will result, the members and exhibitors will lose confidence in the management, and an organization which could have accomplished a lot of good for the industry and for the community in which it was located has been wrecked and ruined because of these facts.

We make the following suggestions which should have the careful consideration of all poultry association officers:

Be absolutely on the square with every exhibitor and every one connected with your association.

Be courteous, yet firm when you know you are right. Show no favoritism. Every one must look alike to you when it comes to questions of right or wrong.

Be on the lookout for everything which might add to the attractiveness or popularity of your show.

Be careful about exhibiting your own birds in your own show. In fact, we hardly feel that it is wise for the Secretary or Superintendent to exhibit their birds in a show which they are managing. This wrecks many associations.

Be sure to give the exhibitors in your class, if you should exhibit your birds in your own show, the advantage of every doubt. You should at least never compete for any special prizes in such cases as this. Let the judge award the regular prizes and refuse to compete for the specials and there cannot be much objection to you showing in a small show. But even then there will be someone who will say, "Of course the judge gave them the prizes. The judge knows they have to employ him and he therefore favors the officers."

Never knock on any exhibitor, on his birds, or on the judge. If you cannot say anything complimentary then don't say anything. It is a duty you owe your association and the industry to keep down dissension and criticism. If you see you have made a mistake in the selection of your judge, then profit by it and make a change the following year. Never stir up trouble, but do all you can to keep it down.

Always bear in mind that if a breeder spends an entire year in raising a bird, and he conditions his bird and pays his entry fee that he is entitled to all the favors you can show him. The exhibitors are the ones who make our shows, and we care not whether they enter one bird or a hundred, the show officers should see that a square deal is given each of them.

HINTS TO EXHIBITORS

We are glad that the general public is gradually getting away from the idea that all people who manifest much interest in poultry raising are "poultry cranks." To make the greatest success of any undertaking, it is necessary to be somewhat of a crank on that subject. Because you love and believe in your business is no discredit to you, but because you do believe in it is no reason why you should make yourself obnoxious, disagreeable, and unreasonable to those about you or to those who disagree with you.

The exhibitor who makes friends for himself and his birds is the one who is willing to overlook some faults in the show management and the judge. Errors will occur in the best and most carefully conducted institutions. Men will differ as to their views. One will like one color and shape, and another will construe the Standard to mean another shape and color. We can never get away from such differences of opinion. The exhibitor must consider these facts and make due allowance for same.

A poultryman raises a chicken; he admired the egg even before it went into the incubator; he admired the hen that laid the egg, and the male that fertilized it. To him the chick looked like it was going to be a prize winner from the time it was hatched. He nursed it along and gave it special attention, and, as it grew and developed, he was blind to its bad points and could see only the good ones. He conditioned the chicken and put it in the show room, and he swelled with pride as he paced up and down the aisle and showed all visitors his chicken which he felt was certain to win the blue. He had magnified the good points in his bird many times and had minimized its defects.

When the judge came along, he was looking for all the defects. He saw many defects and some disqualifications to which the breeder had been blinded. The judge placed the bird where he thought it properly belonged. Oftentimes such disappointed exhibitors become muckrakers and troublemongers. They make accusations against the judge and the show officers and make things very unpleasant for everyone.

An exhibitor seldom makes anything by protesting a decision. Most of our judges are honest, and if you are willing to trust your birds to one's judgment, you should be willing to abide by his decision and make friends for yourself and your flock by being a good loser, even though you feel that you got the worst end of the deal.

As a rule, the amateur's visit to his first poultry show is full of surprises. Generally, he is on the ground early and instead of finding everything in order and the building looking like the pictures he has seen of well-arranged show rooms, he finds everything apparently in great confusion. Birds are arriving, the feed man is looking for a place to unload, exhibition coops are being set up (if the association is to cage the show) or are being arranged for the reception of the birds. The superintendents and assistants are rushing here and there and the secretary is trying to straighten out delayed entries and locate birds that have gone astray, while a dozen other matters that should have been attended to before are now taking up his time and exhausting his patience.

Right here we cannot refrain from saying a word in praise of that much abused person, the secretary, especially the secretary of a small local show, such as our amateur is supposed to be attending. The secretary of a large show has, of course, had experience or he would not be secretary, and that experience enables him to systematize his work so that his assistants can go ahead with the routine clerical work, while he devotes his time to a general supervision, bringing order out of chaos and keeping things running like a well oiled machine. It is the secretary of a small show who is entitled to our sympathy and our praises. Upon him falls the brunt of the whole show. If it fails, he is to blame; if it is a success, someone else claims the credit. He is greeted with, "Mr. Secretary, how about this?" "We thought you were going to do this or that or the other thing." "Why didn't you do this?" "How about this bird?" "This leg band number must be wrong." "My birds are going to be right here by these windows or I don't show." The things he has to contend with would drive an ordinary man distracted. We have yet to find the secretary of a small show who was glad to accept the position a second time.

In the midst of this confusion the amateur, if he follows the instrucitons given, will have the satisfaction of knowing he has entered his birds correctly, shipped them carefully and has seen that the shipping directions were plainly written or printed. Now he should keep cool and see that his birds are all right and either kept away from the dirt or covered so they will remain in good condition. If they are a trifle light in weight, see that they are given a good feed, and if a little too heavy, see that they are weighed without feeding or mark their coop "Do Not Feed" plainly enough so that the attendant will notice the directions. See that the inside of the exhibition coop is wiped out and be in no hurry to cage or uncover your birds and put them on exhibition. Keep them quiet and keep quiet yourself—be the "dark horse." Just as soon as you begin to show your birds and talk about them, you will find that a crowd will gather and they will want to see and handle your birds and the chances are that the birds will have some feathers broken or will get soiled and dirty, which might mean defeat. Look at the other fellow's birds and let him tell you what fine ones they are and how he is going to sweep the deck, etc., but do not let it discourage you. You are there to learn, and you can learn a whole lot by being an interested bystander for the first day. You may "get next" to some interesting things pertaining to conditioning that you had not thought of before. You will hear all sorts of rumors about this or that exhibitor, the birds he has bought, and a few other things. We have heard it all and found, usually, when the truth was learned that it was like the story of the empty house—there was nothing in it.

On the other hand, the amateur will and should make the acquaintance of men whom it is good to know, men who have been on the job for years and who learned that the secret of success is to use common sense in the care, mating, feeding and raising of the chicks. The amateur will find that such men are in the majority. although one loud talker and kicker will make more noise than all the others put together. But these older and successful breeders will give the amateur a lot of good, sound advice. Visit with such men and you will find yourself well repaid for the visit to the show.

THE MODERN POULTRY SHOW

The modern poultry show is a big thing. Some business firms are well repaid if they do a business amounting to $50,000 a year. Our large modern poultry shows do a business that runs well into the thousands and it is all done within the short space of two or three weeks. The amount of money handled and the business done in connection with these shows is really amazing. Hall rent alone at some of these large shows amounts to over $2,000 a week. Cooping from 2,000 to 2,500 birds costs generally a dollar a head. The feed for that many birds costs quite a sum of money and the help to handle the business costs a great deal. The premiums cost money and the only revenue worth speaking of is the door receipts. A big snow storm at the wrong time can be the means of a large show losing thousands of dollars. The whole work of these large shows is so systematized that it can be handled with dispatch and accuracy.

It was interesting and instructive to watch the setting up of the Kansas City show. The land show had occupied the large hall the preceding week and did not get out until nearly morning of the day the poultry show was to open. Early arrivals found the hall in a state of great disorder. Birds were arriving by the wagon load and coops were being piled up in the hall. The amateur wondered what was the matter and if there really was going to be a poultry show.

A plot of the hall had been prepared by an architect, so the secretary knew just where every booth and every coop was going. Entries had closed two weeks before the opening date, so he knew just how many birds there would be in each class. He knew just how long each row was to be and the number of feet between each row. Knowing these facts, it was a comparatively easy matter to make the allotments for the various classes. A large corps of men were busy setting up the cages, while the business men who were to occupy booths were putting them up. As soon as the entries were closed, the classes were alloted and the exhibitor notified of the number of the coop or coops his birds were to occupy. As soon as the cages were up and numbered, the exhibitors could, if they wished to do so, clean out the cages and prepare them for the reception of their birds. If the exhibitor was not present, the association had experienced men to look after the cooping and to see that the birds were checked into their proper cages. This is why we advised the amateur to see that his cages were wiped out. Birds caged a day or so before the judging begins, especially if placed in a dirty cage, will get soiled by rubbing against the dirty sides of the cage. Remember not to be in a hurry to cage the birds or place them in position the first day, as the judging will not begin until the next morning.

By having things so well planned, order came quickly from seeming chaos and by three in the afternoon the cages were all up and most of the birds in their places. The finishing touches, in the way of decorations, were completed by six o'clock and everything was ready for the judges and the public the following morning. This is no more than can be done by the smaller associations if they will have some system, each man knowing what his work is and doing it; or have someone in charge who understands the work and whose orders will be promptly obeyed.

The modern poultry show is an important institution. There is something more to it than the mere winning of ribbons. None of us are too old to learn and at the poultry shows we see not only the latest and most improved specimens of fowls of the different breeds, but also the appliance and feeds used in raising them. We are glad to note that during recent years poultry associations are paying more attention to institute work. Lectures and talks are given by men who are acknowledged authorities on various subjects. Three days put in at a modern poultry show will teach the observing amateur as much as he can learn in months from books. It is helpful to read poultry literature, but at the poultry show or poultry institute the breeder is brought in contact with the people who know and, as a rule, what they say makes a lasting impression. Many of the talks and lectures are illustrated by pictures and living specimens.

Of course the winning of ribbons is very important to the man who offers stock and eggs for sale, and our best breeders fully realize the value of winning at our largest shows. We put our birds to the test and the reward of the winner is that he cannot supply the demand for stock and eggs. Were there no poultry shows we would have no way of showing the improvement we are making in the breeding of our birds and the interest in thoroughbred stock would soon diminish, if not die out.

IMPROVEMENTS NEEDED

Both the exhibitor and the judges no doubt could suggest several improvements in poultry shows, especially in connection with the management of the smaller shows. First, we would mention that of classifying the various breeds and varieties. By that we mean that all the Barred Rocks should be together, all the White Wyandottes together—each kind should be separated from the others. In too many of the smaller shows the various breeds and varieties are all mixed up and the coops of a breed or variety are widely separated in different parts of the hall. Many times visitors coming into a show room are unable to find the winning specimens, and nearly everyone feels a desire to see the winners.

We have judged classes and, after asking the superintendent and clerk if they were all of that class and being answered in the affirmative, have turned in the cards to the secretary, who proceeded to foot them up and book the scores preparatory to hanging the ribbons. It has happened frequently that the secretary, to benefit the exhibitors, has hung up the ribbons before booking the scores, and after getting the ribbons hung on the cages we have found there was a coop or two in some out of the way place that had not been scored. These proved to be the real winners and the changing of the ribbons bitterly disappointed the ones who had thought that they belonged to them. The cause of this trouble, in the majority of cases, is that some local breeder selects a well-lighted place near some window, thinking thus to obtain an advantage. A competitor selects another window and the result is that birds shipped in have to be placed where there is room for them. This is a poor practice. Classify the breeds and varieties so they will all come in a row. If one has a better light than the other, the judge will take those in the poor light to the window so they will get their just dues. When a show is well classified, visitors can look over the particular class in which they are interested and study the winners, as well as the others.

Then there is the weight question. The last edition of the Standard says: "Each specimen at all score-card shows shall be correctly weighed, regardless of circumstances. The practice of allowing a few ounces is expressly forbidden, inasmuch as it works great injustice. It has a harmful influence on the judge, the exhibitor, the local association and the industry at large, and many times deprives prudent and worthy fanciers of prizes rightfully due them." The Standard is right about this matter and the practice of allowing each fowl a quarter of a pound extra should be discouraged, in fact, should not be allowed.

Rules prohibiting the handling of any birds other than your own should be strictly enforced. Many a bird has lost a premium through careless handling, which caused a wing or tail feather to be broken, not intentionally perhaps, but they were broken nevertheless and the bird suffered in consequence.

It is a common thing for local associations to start their catalogues off by saying, "This show is run according to the rules of the American Poultry Association," and then follows a page or two of rules that directly conflict with the rules set forth by the A. P. A. It is all right and in many cases necessary to have some local show rules, but care should be taken that they do not conflict with those of the A. P. A., but in case they do conflict the judge must abide by the A. P. A., but in case of dispute some exhibitor is apt to be greatly dissatisfied.

Another point worthy of mention is the importance of having a good clerk for the judge. A good clerk, one who is quick with the pencil, who makes neat figures and is not so interested in the bird being scored that he cannot pay attention to the card he is filling out, is of incaluculable value to a judge.

Judging poultry is work—hard, physical, mental and nervous work—and the exhibitors should be a little careful about crowding around a judge and asking questions when he is busy with a specimen. Wait until he is through with the birds or class and then ask him all the questions you wish. We know of some of the best natured judges who have been accused of being cranky because they did not have the time to stop to answer questions. The judge's mind must be concentrated upon his work and it is not fair to him nor to the association that employs him to interrupt him.

There is one other thing we should like to see eliminated, and that is the suspicious exhibitor. An association engages a judge and advertises him as being honest. This announcement should be unnecessary as it throws a slur on the preceding judge, who may have been perfectly honest, and if a judge is honest, why is it necessary to announce it? However, if you think best to do so, announce the fact that he is honest, but after doing that, do not treat him from the minute of his arrival as if he were under suspicion. There is nothing more humiliating to a judge when he stops to greet and shake hands with some old acquaintance than to hear some exhibitor say, "He has him fixed all right, you will see that fellow will win."

There are about one hundred and seventy-five licensed judges and we are personally acquainted with perhaps one hundred of them and there is not one of that hundred whom we think would be intentionally dishonest in his work. Judges make mistakes, we all do, but that does not mean that they are dishonest. There is a common saying that when a julge dons his duster he either forgets his friends or he has none. His mind is on his work and any attempt to influence him would be rebuffed and result in failure. If you or your association cannot trust the judge, do not engage him, but if you do engage him, treat him as if he were honest until, at least, you can prove that he is not.

If the competition is close, the prizes many and large, there is nothing that pleases us more while judging than to have some good, light room or have a space barred off near a window and have the cages carried to us. This can only be done at a score-card show, but it has been found very satisfactory and if such arrangements are made before hand the judge and exhibitors will both be satisfied.

The officers of a small show usually exhibit, and this gives rise to more or less trouble. Why should they not be allowed to exhibit? You elect them to office because you trust them and acknowledge their ability. They were made officers of your show, in most cases, because they are prominent and successful breeders. Naturally, they wish to show and should be allowed to show and win if their birds have the quality, without some disgruntled exhibitor accusing them of having won because they were officers of the association. Be fair to yourselves and be fair to your officers and judge. Be sportsmen enough to be good losers or do not exhibit. If you think the judge is crooked, attempt to buy him and you will soon satisfy yourself that you have made two mistakes—one in thinking that he is crooked and the other in tempting him.

WHY EVERY FARMER AND POULTRY RAISER SHOULD JOIN THEIR STATE POULTRY ASSOCIATION

Membership in a state poultry association is of far greater value than anyone realizes. The benefits to the industry, to the state, and to the individual member cannot be fully appreciated.

The object in joining the State Association should not be for the good which you will derive from it, but the main purpose should be to put something into an organization that will unite and build up the industry in which you claim to be interested. If you feel this way about it, the mere 50 cents or $1.00 annual dues is but a mere trifle to which no one should object. Most of us go to a picture show or cafe or ice cream parlor and soon "blow in" more than the annual dues to the State Poultry Association.

Such organizations as this have been responsible for the Poultry Experiment Station in Missouri and the poultry departments of other states. They have made possible the great state shows, poultry meetings and conventions of various kinds for the education and benefit of the poultry breeders of the state. A good strong State Association with a membership of several hundred or several thousand can have a great influence in securing state aid for poultry work. In union there is strength, and if the affairs of a state poultry association are rightly handled such an organization can do an untold amount of good.

If you can unite the entire poultry strength of the state in the membership of the State Association, it is possible to place its pure-bred poultry and its market poultry products far in the lead of other states which do not so organize.

You can publish the fact on your literature and letterheads that you are a member of the State Association. It gives you a standing which you could not have without such membership. Your name, address and the variety of poultry you breed are published in the annual year book. You are placed in a position to secure all bulletins, circulars and literature issued by the association or the State Experimental Station. Every poultry raiser, whether it be on a large or small scale, should become a member of his own State Poultry Association, because it is for his own interest and progress, for the benefit of the state, and such an organization is for the benefit and uplift of the industry in general.

MONTHLY MEETINGS VERY BENEFICIAL

The best poultry associations and those which derive the most benefit from their organization are, as a rule, those which have monthly meetings and at such meetings discuss practical questions, have demonstrations in selection and judging of poultry, caponizing, and other work of a practical and educational value. We cannot too strongly impress upon any association the importance of this class of work. Arrange for special speakers to appear on your program occasionally.

It is to be hoped that the programs given here can be used to some extent, although each organization should alter them to suit local conditions.

The best of such papers should be submitted to the local newspapers, farm papers and poultry journals for publication. In that way your association will get a lot of free advertising, and much good will be done in your community as a result of monthly meetings.

We suggest the following list of subjects for each month. Each association may select and assign enough of the different subjects to different members so that a full and interesting program is assured. We recommend that you vary the program each month to suit your local conditions.

Program for January

1 Business Meeting.
2 Instrumental Music.
3 How to Improve the Flock.

4 Buying the Male Bird.
5 Inbreeding and the Results.

6 Line Breeding.

7 Male Quartette.

8 Double Mating.

9 Preparing for Incubation.

10 Canker, Its Causes and Remedy.

11 General Discussion.

12 Demonstration in Selection and Judging, using live birds.

13 Music.

Program for February

1 Business Meeting.
2 Orchestra.

3 Fertilization of an Egg.

4 Keeping Eggs for Incubation.

5 Selection of Eggs for Hatching.

6 Proper Time for Hatching.

7 Vocal Solo.

8 Packing Hatching Eggs for Shipment.

9 Running the Incubator.

10 Recitation.

11 Chicks Dying in the Shell, Causes and Remedy.

12 Feeding the Breeding Stock.

13 General Discussion.
14 Music.

Program for March

1 Business Meeting.
2 Violin Solo.

3 Brooding.
4 Feeding the Baby Chick.

5 Hatching with Hens.

6 Baby Chick Diseases and Remedies.

7 Vocal Duet.

8 Feed Hoppers for Baby Chicks.

9 Drinking Fountains for Baby Chicks.

10 Selling Day-Old Chicks.

11 Song by the Boys and Girls of the Club.

12 Pedigreeing Chicks.

13 Raising Ducks for Profit.

14 General Discussion.
15 Orchestra.

Program for April

1 Business Meeting.
2 Vocal Solo.

3 Value of Grit and Lime.

4 Keeping Old and Young Separate.

5 Hopper Feeding.

6 Watering Chicks.

7 Best Method of Feeding, Brooding and Caring for Young Chicks and Growing Stock.

8 Range for Growing Stock.

9 Culling Young Stock.

10 Selling Broilers.

11 How Boys and Girls Can Help Raise Poultry.

12 How Late to Hatch Chickens.

13 Raising Turkeys.

14 General Discussion.

15 Music.

Program for May

1 Business Meeting.
2 Piano Duet.

3 Recitation.

4 Swat the Rooster, or Selling Infertile Eggs.

5 When to sell Surplus Breeders.

6 Late Hatched Chicks.

7 Some Good Methods of Ridding Mature Fowls of Lice.

8 Vocal Solo.
9 The Value of Guinea Fowls.

10 Management of the Poultry Yard in Summer.

11 The Stolen Nest.
12 Demonstration in Candling and Grading Eggs.
13 General Discussion.
14 Orchestra.

Program for June

1 Business Meeting.
2 Orchestra.
3 Care of Summer Eggs.
4 Selling the Cockerels and Culls.
5 Summer Roosting Quarters for Poultry.
6 The Broody Hen.
7 Special Music.
8 Candling Eggs.
9 Buying Eggs on a Quality Basis.
10 In What Ways Can our Members Co-operate
11 Capons for the Home.
12 Demonstration in Caponizing.
13 General Discussion.
14 Quartette.

Program for July

1 Business Meeting.
2 Music.
3 Care of the Growing Stock.
4 Importance of Shade.
5 How to Improve the Quality of Eggs.
6 The Farmer's Responsibility with Eggs.
7 Vocal Music.
8 The Merchant's Responsibility with Eggs.
9 Eggs and Cold Storage.
10 Recitation.
11 Judging Eggs by the Score Card.
12 Crop Bound, Causes and Remedy.
13 Scaly Leg, Causes and Remedy.
14 General Discussion.
15 Orchestra.

Program for August

1 Business Meeting.
2 Vocal Duet.
3 Selecting and Conditioning Birds for the Fall Fair.
4 Comparison Judging.
5 Selecting Cockerels for Breeders.
6 Training Young Stock to the Roost.
7 Instrumental Solo.
8 Crowding Young Stock.
9 Limberneck.
10 Raising Geese.
11 Effects of an Empty Water Pan.
12 General Discussion.
13 Appropriate Song by the Entire Membership.

Program for September

1 Business Meeting.
2 Orchestra.
3 Preparing for the Molt.
4 How the Exhibitor Can Help Make a Show.
5 Things to Avoid in the Showroom.
6 Meat Food in Summer.
7 Ladies' Quartette.
8 Separating the Sexes.

9 Going Light.

10 Recitation.

11 The Fall-Hatched Chick.

12 Demonstration.

13 General Discussion.

14 Music.

Program for October

1 Business Meeting.
2 Piano Solo.

3 Feed and Care of Molting Fowls.

4 Molting of Early Hatched Pullets.

5 Poultry Raising as a Side Line to Farming.

6 Work Children can do with Poultry.

7 Male Quartette.

8 How to Prepare and Get Winter Eggs.

9 The Value of Eggs and their Uses.

10 Sowing Pasture for Green Food.

11 Prevention and Cure of Chicken Pox.

12 General Discussion.
13 Orchestra.

Program for November

1 Business Meeting.

2 Orchestra.

3 The Poultry House.

4 Arrangement of Interior.

5 Ventilation and Lighting.

6 Preparing for the Show Room.

7 Vocal Duet.

8 How to Produce Early Laying Pullets.

9 Number of Fowls to be Kept Through Winter.

10 How to Prevent Frozen Combs.

11 Feed Supply for Winter.

12 Colds, How to Prevent and Cure Them.

13 General Discussion.
14 Special Music.

Program for December

1 Business Meeting.
2 Special Music.

3 Score Card Judging.

4 Feeding for Winter Eggs.

5 Balancing the Ration for Egg Production.

6 Marketing Eggs.

7 Vocal Solo.

8 Water for Fowls in Winter.

9 Caring for the Flock on Snowy Days.

10 Recitation.

11 Causes, Prevention and Cure of Roup.

12 Demonstration.

13 General Discussion.
14 Orchestra.

Success or Failure---Which Shall It Be?

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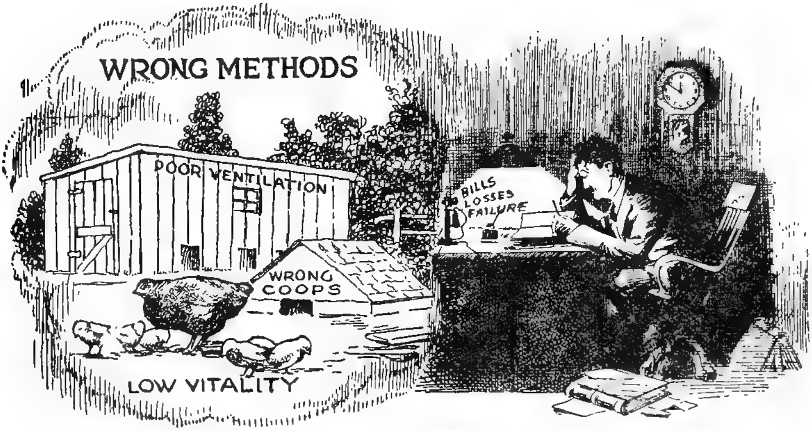
T. E. QUISENBERRY, President

This is a question which every poultryman would like to have result in the affirmative. That a comfortable living and some money can be made from poultry farming as a business or as a side line, there is no doubt. Hundreds are doing it, and many of them are using crude methods and out-of-date equipment. But not every poultry raiser who knows how and who uses up-to-date equipment is going to succeed. A man may be an expert at incubation, he may understand it thoroughly, but he is not going to get a 100 per cent hatch in every case, and in many cases his hatch will be an absolute failure, no matter how extensive his knowledge of incubation. Outside elements, over which he has but little, if any control, might enter in and cause the failure of any expert incubator man in some cases. A man might be a great banker and a wonderful financier and understand the banking business thoroughly, and yet if such a man was not located in a city or a section of the city where there was some business he would not make a success. Outside elements or other influences might, and do enter into the affairs of the best business men sometimes, and cause their failure. Men in all lines of business and in all professions sometimes fail. Then, too, we cannot expect every man or woman who enters the field of poultry culture to succeed in every case. We must all admit, however, that the person who has studied and tried to fit and prepare himself with a storehouse of useful and dependable information is much better prepared and is much more certain of success than one who goes at it with no knowledge or training whatever. It is as absolutely necessary to use common sense and good business judgment if you are to raise poultry successfully, as it is to use those qualities in any other business.

In this course in poultry husbandry you have now satisfactorily studied each lesson and passed each examination down to the present. There are no further examinations or questions to be answered. We are about to give you our parting advice as far as the printed lessons are concerned. We hope and expect to hear from you from time to time, and we desire to aid you in all the problems which may confront you in your efforts to raise poultry successfully. In fact we hope our relations with you and the real instruction which you are to receive from this School have just fairly begun. You should now begin to put the course into practice, if you have not already done so, and we will be glad to help you over the rough places, and use our best endeavor to insure your success in poultry work and to aid you in avoiding failure. So we want you to consider this lesson more as a personal letter of parting advice and warning than as a stereotyped scientific lesson.

What Became of the Profits?

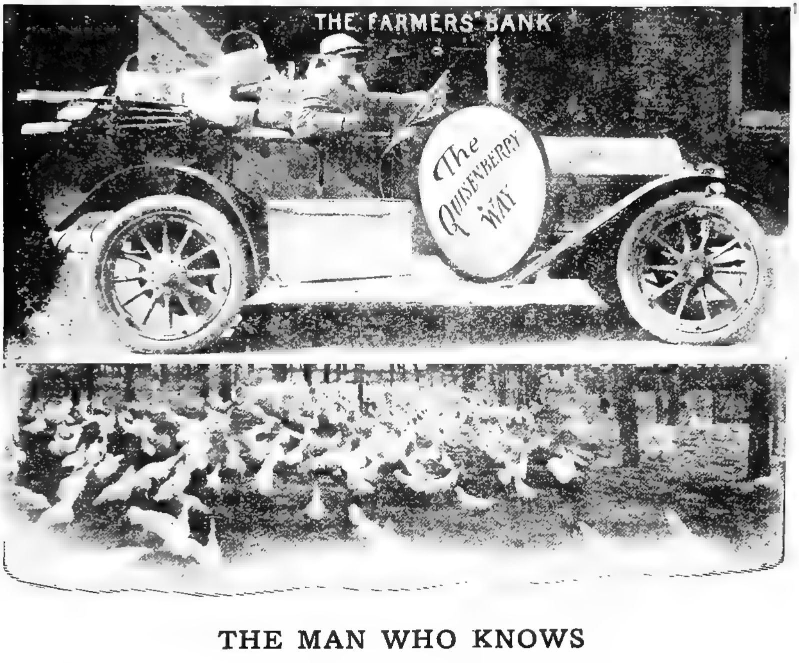
The man who enters the poultry business with a lack of knowledge of same, who has to proceed blindly or by guess, and who has to experiment for himself, would have been far better off, as a rule, had he never started in the first place. The time is certain to come when he will tear his hair and work until the wee hours of the morning and when he will be absolutely disgusted and discouraged. Haphazard methods, guess work, carelessness and a lack of love for poultry or the lack of an actual knowledge of the business is certain to lead to failure. A lavish expenditure of money is not necessary. "Starting right and keeping right" is the one key that unlocks the success box. Many persons, from an apparently poor beginning, but with a knowledge of the business, have won distinction and wealth, while others with gilded houses and canopied runs, stocked with breeding birds that cost fabulous sums have made utter failures. No person will ever reap beyond ordinary success in the Poultry Business without possessing a clear knowledge of the demands, the wants, the desires and the necessities of their flock. These can be acquired by sad experiences and costly experiments, but it is far better, much cheaper, more satisfactory, safer and saner to acquire this knowledge from some one who knows.



WHAT BECAME OF THE PROFITS?

The Man Who Knows

The man who goes into his poultry house with one bucket of Feed and two buckets of Knowledge and Training is the man who succeeds. It is simply a leap in the dark that is almost certain to lead to positive loss and failure to attempt poultry raising without this knowledge and training. In every business, in every calling, in every profession, in every walk of life, Knowledge is Power. There is no business in the world that will bring greater pleasure or more profit in proportion to the amount invested than will the poultry business, providing the man who undertakes it has laid a solid foundation and built from a storehouse of information. Every success in the poultry business can be traced to the man behind the flock. You will find that he has been a close student of his business; he has not been afraid of work; and he has given constant thought and attention to details and has proceeded with a definite object in view. No obstacle is too big for such a man to overcome and success eventually crowns the efforts of all such poultrymen. The object of this Course in Poultry Husbandry has been to furnish information and offer true and tried methods, which enable thousands of our students to succeed, while others fail. Our motto is, "Help A. P. S. Students to Succeed."



THE MAN WHO KNOWS

LARGE PROPOSITIONS REQUIRE LARGE ABILITY

Many people get the idea that because they raise 100 to 500 chickens each year and because they have very little loss, that they are expert poultrymen. Most of these people have plenty of range for their poultry. The chicks are not so crowded but what they do well and make part of their own living. There are not so many chickens in this size flock but what the one raising them has plenty of time for details and they do not have to depend upon hired help, who are more or less disinterested and inexperienced. Therefore, they succeed wonderfully well and make a big profit per hen on these small flocks. They thus get the idea that if they can do this well with 100 to 500, that they could soon become wealthy if they had a larger place, and could devote all their time to the business and hire extra help so that they might keep from 5,000 to 20,000 laying hens and raise that many chicks each year. Right here is where failure comes in many cases. There is as much difference in raising 100 to 500 chickens successfully and raising numbers running from 5,000 to 20,000 as there is between day and night.

In the latter case, you will be obliged to depend upon others for a large part of the outside work and actual labor of breeding, incubation, brooding, feeding and caring for your flock. This help will not take the same pains and the same interest in the details that you did. With the small flocks, your table scraps and many little things of that sort counted more than you thought. Your poultry were not crowded, they had free range and made a part of their own living from bugs, worms, grass, sprouts, roots and such things as they could pick up. Now you are crowded; it is strictly a commercial proposition; everything must be bought and fed; you must depend upon hired labor and it must be paid for from the proceeds; the hens and the capacity of the farm must be pushed to the limit. What shall the harvest be?

We have seen many people raise 100 to 500 chickens each year and do it with ease and make a handsome profit. And we have seen these same people undertake to raise a few thousand chickens on a larger farm and make an absolute failure. Here again you can see the need of a thorough training and an accurate knowledge of the business if you are to succeed in a large way. You take our advice and make certain of "Safety First."

POULTRY FARMING BY PROXY IS DANGEROUS

A great many men with some wealth conceive the idea that there is big money in the poultry business. They know nothing about the business themselves and they employ someone who comes highly recommended, but who truthfully knows little or nothing about raising chickens in a large way. The owner and financial backer of the proposition knows nothing about how to equip, arrange, or handle his proposition so as to make money from it. His trusted employee knows but little more, in far too many cases, and too often has some pet theories and hobbies of his own that he wants to try out at the other fellow's expense. Besides, you seldom find a hired man who will take the same interest in such a business and be as careful of the little details and the leaks as would the owner himself if he were running his own business. Therefore, we say that it seldom pays and is a dangerous proposition to operate a poultry farm by proxy.

It is advisable in all such cases as this to see that the manager and every one employed on the place is competent, is industrious, and has a thorough knowledge of the business. We would require them to take a course in some College of Agriculture, or let them take a correspondence course in poultry husbandry along with their work. We would discourage any one from investing a dollar in a poultry farm if they did not expect to operate it themselves, or require their employees to complete some reliable course in poultry husbandry, or show some evidence of their knowledge and ability, outside of their own word of mouth and ordinary recommendations. Capital entrusted to the right sort of men, who are thoroughly equipped, can be made to produce a nice profit in the poultry business the same as in any other business. But capital alone, in the hands of an inexperienced and unequipped would-be-poultryman, is practically as good as lost when it is invested in such an enterprise. These are facts worthy of consideration.

INDUSTRY NECESSARY TO SUCCESS

In order to succeed it is necessary to work early and late practically every season of the year. On the average farm most of the work with poultry comes early in the morning and late each evening; during the middle of the day there is not a great deal of compulsory work. But it is necessary to do a certain amount of work with poultry seven days in the week and 365 days in the year. The feeding and watering and gathering of the eggs must be done and should not be neglected. While this is all true, yet it is a pleasant and fascinating work to the average person, and especially to those who love poultry. It is not hard work, but it is constant. The man who succeeds with poultry is the man who will see that his fowls are not neglected, no matter what the hour may be. The successful man is often the one who goes through his houses occasionally at night with a lantern. There is not as much of this sort of thing as people imagine and it is not necessary to sit up at night with incubators and all that sort of tommy-rot which we hear so much about, but the point we are trying to make is that the successful man is the one who will look after his business night and day, or whenever it requires his attention. This applies to the poultry business. There are certain details which must be looked after no matter what may be the hours or what may be the weather conditions.

Poultry raising is not a get-rich-quick business. It is a mistaken idea that all you have to do is to throw out any old kind of feed and gather up high priced eggs. It is a fascinating, healthful and pleasant occupation, but it is a business which requires constant attention to details and is not the snap which some people picture it to be. There is nothing worth while which does not require some labor.

THE MAN BEHIND THE FLOCK

Just as the man behind the gun who hits or misses the mark, just so is the man behind the flock who can make or unmake the best calculated plans for poultry raising. You very often find people who will tell you that there is absolutely nothing in the poultry business, that they have tried it only to find that there is no money in it, and that they had nothing to show for their money and labor invested, except losses. I am sure that they are right, but, if you will make a careful analysis of their failure, you will find that in 90 per cent of the cases the man or woman was to blame.

For every failure in the business, I will make the prediction that it can be directly traced to a lack of knowledge and attention to details, haphazard methods, carelessness; or, probably, a lack of actual business knowledge, or perhaps a lack of love for poultry.

It is the man who makes his flock and not the flock that makes the man. The flock will make the man provided he will give constant thought and attention to details and proceed with his work with a definite object in view. Every success in the poultry business can be traced to the "man behind the flock." The influence of the "man behind the flock" must be shown in the business methods employed, as well as in the care and management of his flock. Therefore, please bear this thought in mind, that if you fail it is generally your own fault and that the influence of the "man behind the flock" is really the one big thing in the business. Success is directly traceable to the love of poultry and to a study of tested methods of others who have reaped a reward for their enterprise. Be wide awake to anything that will solve your poultry problems, be those problems a baffling disease, or the feeding and care of the flock to the minutest detail.

PEP AND COMMON SENSE BRING RESULTS

"When some bright mind solves the problem of why ninety-three per cent of the people who engage in business pursuits fail; when the question is settled why only ten per cent of the people own their own homes; when the question of why the very rich are growing richer and the very poor are growing poorer has been unraveled; when we understand why millions go half nourished while the land is panting with a plenitude; when a myriad of mysteries like these are cleared away, then will it be known why so many persons who engage in the poultry business fail and so very few succeed.

"The successful poultry raiser need not have a college education or be informed on the arts or the crafts, though he would be all the better off if he possessed these accomplishments, but he must have adaptability for the business. He must understand the wants and the desires of his flocks, and care for them as he does for his children by providing for them in fair and foul weather. If he does not want to do these things—if he wants his flock to 'just grow'—he had better save his money, time and a disappointment, for fail he will if any department of the business is neglected.

"If a man or woman desires to 'kill a little time' or 'just fool with a few chickens' they should not be classed as being in the 'poultry business.' They are not. They belong to that large class that really and truly 'kill time' and 'fool with chickens,' yet the indiscriminating public regard them as such and when one of them 'fails' another failure in the poultry business is checked up. Fortunately, however, the world is becoming a little more discriminating and is not so seriously considering the person who is 'killing time' and 'fooling around.'

"To succeed in the poultry business means the same close application of business principles and the same wise expenditure of capital that is applied to any other calling, whether it be among the professions, tradesmen or artisans. A lavish expenditure of money is not necessary. Starting right is one of the keys that unlocks the success box, this theme being too big a subject to discuss here. Many persons from an apparently poor beginning have won distinction and wealth, while others with gilded houses and canopied runs stocked with breeding pens that cost fabulous sums have made utter failures. Procrastination and vermin will route the finest hennery on the continent, while perseverance, some money, much patience and cleanliness will bring a lowly start to a lofty pinnacle. A doctor will not be much of a success unless he understands the science of medicine, has patience and knows how to apply the remedies to the disease. A merchant, though he occupies the best located building in his town, will not grow rich unless he has the goods to sell which the people want, understands the art of securing customers and has sufficient executive force to hold his trade when once established. An emery wheel will never grind a scythe unless there is driving and guiding power back of it. No person will ever reach beyond ordinary success in the poultry business without possessing clear knowledge of the demands, the wants, the desires, the necessities, of their flocks. The breeder should understand the anatomy of the fowl, their natural habits, and should study their dispositions. These can be acquired by sad experience, observation, reading and studying.

"Naturally a 'bird of the field,' flocks of poultry are now confined in small houses and short runs. From liberty and freedom they are brought to close quarters. From securing much of their own food by roaming the neighborhood the best poultry of today have their every want supplied. From laying her eggs under the barn in the straw stack, or in the hay loft, Biddy is now trapnested. From roosting under the shed or in the trees she now sleeps on an easy perch in a comfortable house. With the incubator and the brooder she is saved the time and care, the vicissitudes of hatching and rearing the young. Passing from the natural to much that is artificial the hen has grown in productiveness, in weight, in value and in appearance. Government statistics say the average hen in America lays 80 eggs in a year. The successful poultryman would chop the head off of any hen that will not produce 115 eggs in a year. In a contest lasting through a year a hen confined with four other hens in a small house on a small run laid 281 eggs. In 82 consecutive days she laid 82 eggs and she sold—actually sold—for $800.00 cash. And she was worth every cent of the price. The man who produced her is 'in' the 'poultry business.' He is not 'killing time' or 'fooling with a few chickens.' He has brains and ability, and is using them just as does the manager of the great department store. The lack of application, the want of discernment, the failure to see what is going on before you, the lack of power to learn by experience, gives an insight into many of the causes why multitudes fail to make money raising poultry—and making money is the mark of success. In every business, in every calling, in every profession, in all the walks of life this is true.

"Every year the poultry industry increases in volume and in wealth. Experiment stations throughout the country are paying as much attention to the proper raising of fowls as they are to the proper production of corn. It is not the intent to place either industry on a 'scientific' basis, but rather on common sense ground—to try to get the people to see that they are wasting time, money, energy—their very lives—in producing inferior products when a superior stock and grain are easier to handle and are what the people demand, saying nothing of the profits accruing therefrom.

"Put into the poultry business the same tact and talent that the business man puts into his merchandising and the same results will follow. There will always be the 'big' store in the twenty story sky scraper. There will always be the 'country' store at the cross roads. Both supply a want. There is the great middle ground in which all can stand and where all but the negligent can succeed. There will always be the vermin infested hen and she will always sell to the huckster at the lowest price, while the hen bred for usefulness will be on dress parade in the show ring, she will be housed and fed the best, her eggs, her progeny and herself will attract wide attention and she will sell for the high price."

REASONS WHY SOME FAIL

Lack of attention to detail is vital in poultry raising. You could not expect to get the most out of any business in which you might engage, if you did not give it your very best thought and attention. I do not know of any business or industry that will run itself and insure a profit to the owner without the care or oversight of some person who understands how to manage it. The poultry business is no exception to the rule. The details of the work must be attended to. It is an easy matter to drift into the rut of neglect. One neglect leads to another, and it won't be long until you will find that success is gradually slipping from you, and that your work will be so piled up that it will be impossible for you to get from under the load which you have allowed to accumulate. You must care for every part of the work, and give this care when it is most needed. Be prompt.

The causes of failure are many. Allowing the poultry houses to become filthy, or allowing the droppings to accumulate either in the poultry houses or in the coops occupied by the young chicks, is certain to lead to trouble. These are places where disease and lice will flourish, and, if you are to succeed, it is necessary to keep them out of your flock. Proper methods of care and cleanliness will enable you to do this. You had better give a little extra attention from day to day and keep the fowls in good condition rather than to allow something like this to get a start and then spend a great deal of time and money in trying to eliminate it.

Many failures are due to a lack of sufficient knowledge of the business which make it impossible to carry out the work to the best advantage at all times. You must learn the business. The one who does not thoroughly understand the work and suffers some losses has more in his favor than the one who does understand it and through neglect allows a loss to occur.

These small details if neglected and allowed to accumulate will lead to loss and often to failure. Good feed may fail to bring the proper results if the fowls lack a supply of grit, or a lack of grit may lead to digestive disorders that will result in diseases, deaths and losses. Lack of water will cut down the egg yield. Grit and water do not cost much and many consider them of small importance, yet the lack of them may upset your whole plans. Lack of pure, fresh water, green food, protection from enemies and animals, and many other small things might be responsible for failure. The wise poultryman is the one who will keep on the lookout for these small details.

EASY TO FIGURE PROFITS

There are perhaps but few businesses where it is so easy to take a pencil and paper and make a millionaire out of yourself quicker than to figure the profits to be derived from poultry, and you can start with only one hen at that, but in spite of the fact that it is so easy to figure the profits and that it shows such glowing prospects we would not advise any one to engage in this business who is looking for a "get rich quick" scheme, for few people of that sort make a success of anything.

The country over is dotted with elaborate poultry plants which have been constructed by just such people at great expense, but which can be bought, in many cases, at junk prices. These are usually pet theories worked out by successful city business men who get the idea that anybody could raise chickens. These people began at the top and worked down, instead of beginning and laying a foundation such as you have done by taking this course and getting some experience. Knowledge and training—safe and sane methods—are absolutely essential to one's success, and it is best to begin at the bottom and build up.

It is a business that has its ups and downs. It has its profits and its losses like any other business. The whole thing centers on the one point of bringing poultry keeping down to a matter of business enterprise and common sense.

Any one who is looking for a soft job had better not attempt to raise poultry. There is work, rain or shine, 365 days in the year. The amount of success in "dollars and sense" is in a direct ratio to the number of birds and the area of space devoted to their keeping, as the comparative degree of success with a small or large flock in the back yard or on larger space varies but little, providing you know and apply correct methods.

The variety of birds kept makes but little material difference. There is need of the same thoughtful attention and watchful care in the keeping of a small flock as is neceessary on any of the large poultry farms.

Short cuts, schemes and "isms" haven't any more place in poultry keeping than in any other commercial pursuit. A systematic arrangement of details and a regularity of routine, coupled with cleanliness and perseverance will pay in poultry keeping as well as in other businesses.

STUDY SUCCESSES AS WELL AS FAILURES

Those who know of failures in the poultry business might profit thereby and become wiser if they were to take the time to investigate the cause of such failures. If such plants are within a reasonable distance of you it would pay you to visit them and try to profit by their mistakes. If you know of any chicken business that is paying in or near your community where you might gain a store of information, if it is possible you should visit such a place and make personal observations. You should at all times seek the very best information that it is possible for you to get. Make investigations and examinations. Size up different poultrymen and their farms and make deductions that you can apply in your own business. If once started, stick to the business through thick and thin and do not become discouraged when a few things go wrong.

UNREASONABLE RESULTS EXPECTED

I do not know of any business where such impossible results are anticipated and demanded as we often find by the average man who speaks of this business or by many who contemplate engaging in poultry raising.

One man said, "Well, it is a nice clean business, not much work, you are your own boss, etc. If I could be assured that I could make $5,000 a year at it, I would not hesitate a moment in making a start." No, neither would any one else. Where is the man who can step into any business and with a limited capital be guaranteed a net income of $5,000 a year? The man who made the statement could not command one-fifth of that salary and really earn the money. Such people as this often enter the poultry business and then blame the business because of their failure. You will note that he stated that not much work was required. This is another mistaken idea that many have, and when they get into the business they find that they were disappointed and they soon become discouraged and finally quit.

"Can you insure me against failure," asked another individual. Is there any business in the world that guarantees one's success? Why, then, expect the poultry business to insure you against failure? There is a good margin of profit to those who have pluck and grit, who have knowledge and business sense and who will properly apply same. The speculator is generally content with a 10 per cent dividend but the man who invests in poultry expects far more, as a rule.

There is still another class, who have been doing indoor work and have poor health, and whom the doctor has advised to get some outdoor occupation. In nine cases out of ten such men pick out the poultry business, "as the work is light and the investment small." Their supply of available cash is very limited and their store of knowledge is less. What is the inevitable result of such undertakings? Failure is plainly written upon the face of them. There is a reasonable profit in the business to even this class, and often-times their health is restored by undertaking poultry work and, in such cases, it seems to me that restored health is worth all that money can buy, and is a fortune within itself, and even if this class suffered a slight loss they ought to feel well repaid for having undertaken the poultry business.

There are others who have no money but would like to lease or buy an established poultry farm, if the owner is willing to sell or lease the place, on condition that the money come out of the profits realized on the farm. Such chances are as scarce as hen's teeth, and in most cases a man would not succeed even if he were given the opportunity.

There is still another class who have failed at every other sort of business in which they ever engaged, yet who feel that they can make a howling success in raising poultry.

There are scores of other men who are looking for jobs on poultry farms that want to learn the business and expect to be paid a salary while doing it. They want to learn at the other fellow's expense. In other words, they expect such a large salary that they really want you to teach them how to make a living and also pay them for the privilege of being taught. This is a splendid way for beginners to learn the business, but during that period they ought to be content with a small wage and ought to apply themselves so as to make their services really of some value to the man or farm for which they are working.

LOCATION

In the first place, a suitable location should be sought. By suitable location, we not only mean a piece of land that is suited for raising poultry and producing eggs, but so located that you will have a demand and a market for all that you produce and at a good price, a price that will insure you a profit above the cost of production. What profit would there be in any business, if you were so far from a railroad or so far from a good market that the transportation charges would eat up all your profits? Many great coal fields and rich minerals of various kinds remain undeveloped today because they are so far from a market that it is not profitable to mine them.

If a poultryman selects a location where he is so far from market that his product deteriorates before it reaches the consumer, or so far that the transportation charges exceed the value of the product, he is handicapping himself at the very beginning and makes his chances of failure greater than they would otherwise be. Do not get too far from market. Do not get located at such a point that your eggs and poultry will be compelled to be transferred several times en route. Try to locate where there is a demand for your produce at good prices.

Yet a good location has also to do with the kind of soil and the lay of the land. You may be near a good market, and still ruin your chances of success by making a poor selection of land. We do not care how favorable other conditions may be, many failures are made certain before a single building is erected or a head of stock is put on the farm. There are thousands of failures due to this one fault. You cannot be too particular about this one thing. With a good location, you are in a fair way to overcome many other mistakes which you are certain to make. But with a poor location, it is almost impossible to succeed, no matter how good your methods may be.

We recently visited a farm that was about to fail. They had a very flat piece of bottom land on the banks of a stream, on which they had erected all their poultry houses. There was always a fog hovering over the place. The atmosphere was damp and cold, and there was no air drainage. The result was that colds and roup put this man out of business. Air drainage is just as important as water drainage. This same man had 200 acres of fine land suitable for poultry raising just adjoining this. He had simply made a mistake in the selection of a location for his poultry buildings and yards. The trouble and expense, the loss of birds, the extra labor required in doctoring sick fowls, and the decrease in egg production, caused by the birds being out of condition and feeling uncomfortable because of the atmosphere and location in which they were living, over-balanced all the benefits of good equipment which the man had, and it simply put him out of business. A mistake of this sort, made at the very beginning of your career as a poultryman, would more than likely prove fatal, in spite of the fact that your knowledge of the poultry business might be the very best as far as methods and other factors were concerned. A few dollars spent in finding a suitable location may save you hundreds and even thousands later on.

By a suitable location, we mean land that has good surface drainage and air drainage. We mean soil that is sandy or gravelly, or a rich black loam. We warn you against cold, damp clay land. Get up on the hillside, or on a spot that is dry and at least as high as most of the country surrounding it. Try to select a location where your houses can face the sun, at least a portion of the day, and where your fowls will be protected from the hard winds, if your country is subjected to such. Avoid any location where the land is sour or easily becomes sour, and where the land is covered with a green scum or moss. Avoid marshy land. Select a porous soil.

On account of the soils and climates of the different states varying so, it is impossible to state just how many hens can be or should be kept on an acre of ground. In certain sections of California, where the climate is dry and the soil dry and sandy, 1,000 or more hens can be kept on an acre of ground; but in most sections of many other states, where there is considerable cold, damp, clay soil, and often continued damp rainy spells, and where the soil is inclined to pack and become sour and diseased, it is not safe to keep more than 200 or 300 hens to the acre. So you can see that much depends upon the soil and the location. Do not handicap yourself by making a bad start.

HOUSES

Mistakes made in housing poultry are often costly and sometimes fatal. It is not necessary to build elaborate or expensive houses. That is one mistake which is quite common with such persons as those who start out with a lot of money to invest in equipment. The things to be desired in any poultry house are convenience, simplicity, comfort, sanitation, dryness, sunlight, and proper ventilation.

The winter egg yield can be increased or kept at the maximum if the poultry is properly housed and receives proper care. The house plays a very important part and if properly designed and constructed will advance you well along on the road to success in the poultry business. Improper housing is often responsible for many ills and for great mortality.

A good poultry house can scarcely be built for less than an average cost of $1.00 per bird for the average climate. In no event do we believe a poultryman would be justified in building a house that would cost him more than $2.00 per bird capacity. The houses should be equipped with labor saving devices. One man must be able to handle a large number of hens if he is to make money in the poultry business. The amount of floor space per hen should be about three square feet for laying stock, and from four square feet up for the breeding stock. The breeding stock should be compelled to take lots of exercise, while the laying stock require just enough to keep them in good health. It is fertility and hatchability in the eggs that you want in one case and it is eggs and lots of them that is wanted in the case of the laying stock, and these things should be considered when planning and building your houses.

The location of your poultry houses with reference to the other farm buildings is very important. Much valuable time is wasted in passing from house to house, and by being compelled to open a lot of gates and doors. Time and labor are the same as money in the poultry business. A combination of little things like the above are just the difference between profit and loss, between success and failure, on many poultry farms. Build your houses so they will be conveniently located, simple and easy to keep clean, and large enough so that you can keep enough hens in any one house in order that the number of eggs gathered from the flock kept in that house will pay the expense of feed and care, and a reasonable profit besides. If your houses are so arranged and your flocks so small in each house that the average daily egg yield in any one house does not pay the cost of the labor required to make the necessary trips to that house and the cost of feed and care for the flock contained therein, then you are going backward instead of forward with your poultry venture. It is simply a dollar and cents proposition, and the cost of getting about to feed, water, and care for the flock, the expense of cleaning and gathering the eggs, should all be charged up against a house and the flock therein. Each house is simply a unit on which you either make or lose. Therefore, it behooves you to arrange your house so as to save labor in maintaining and operating your farm.

Because of the above reasons, we recommend large houses for flocks of laying hens. Units of about 500 laying hens are best, in our opinion. It requires but little more labor to care for a flock of 500 in one house than it does 200 hens kept in four small houses of 50 hens each. You may get a dozen more eggs per hen in the smaller houses and the death rate may be a trifle less, but the saving in labor more than offsets these items. You will get more high priced winter eggs in the larger houses, because the hens keep warmer in larger flocks. Also, one man can care for 3,000 to 4,000 hens in the larger flocks but he can scarcely care for half that number when kept in small houses widely scattered.

The above refers only to laying hens. We prefer smaller flocks and more range for the breeding stock. In this case, the thing which you are striving for is an abundance of vitality and fertile, hatchable eggs. In order to get these, you can well afford to pay the extra cost of care and labor.

As to the type of house, we still insist that there is nothing which excels the Improved Fool Proof Poultry Houses or the Missouri House, illustrated and described in Lessons 1 to 4. This house is good in all climates, but especially so in cold climates because of the straw loft. When it gets much below zero it is best to cover the interior of the shutter ventilator with burlap. In cold climates, they must be built more substantial and less open. In warm or mild climates, the ventilators should be made larger, and in very warm climates they can be built with the front entirely open. The principles involved in these houses can be used in every climate, and if you have a reasonable amount of common sense you can alter the plans to meet your local weather conditions. If you are in doubt about anything, do not hesitate to write for instructions.

The best plans for laying houses, we think, are the Improved Fool Proof Poultry House, the Missouri House, Laying House for 1,000 hens, Lesson 1 to 4. The best houses for breeding stock are the colony houses and the Farmer's Fool Proof Poultry House, described in Lessons 1 and 2.

You can use any size window sash that you prefer, but allow about one square foot of glass to every ten square feet of floor space. In the average climate you should have about one square foot of shutter ventilator to every ten square feet of floor space. In the warmer climates use more than this, and in the colder climates tack a thin cloth over the interior of the shutter ventilator in the coldest winter weather if you find it necessary to have additional protection. The windows should all be arranged so as to be opened in summer months.

We think you should use a concrete foundation such as is recommended with the Fool Proof Houses. If you prefer a board floor to concrete we would recommend putting in a concrete foundation and placing iron ventilators in the sides and ends of the foundation to admit ventilation under the floor and at the same time make the floor rat proof. You can lay a double board floor on the concrete foundation if you want it extra good and dry, but in most climates a single floor answers very well. A dirt floor might be used inside of the concrete foundation in some sections, but we prefer either a board floor, constructed as stated above, using a concrete foundation, or else a good concrete floor. Concrete floors must be built in the spring or summer to give them time to become thoroughly seasoned and dried out before winter. Also, provide for plenty of under drainage, or put a string of tiling every six feet just underneath the floor and let it extend from one side of the foundation to the other. The air in passing through will keep the floor perfectly dry.

The average dirt floor is really dangerous. We have seen dozens of poultrymen make absolute failures solely because of dirt floors in their poultry houses. You find an occasional soil and climate where dirt floors are as satisfactory as any, but ordinarily the soil becomes taitned and infested with disease germs, and disease is often spread in this way. We recently saw hundreds of chickens lost in one flock because of dirt floors. One pen became infested with a disease and it spread from pen to pen through the dirt floors. Pursue the safe course by building concrete floors, or wooden floors with concrete foundations as suggested above, or else build cheaper wooden floors without the concrete foundation and get them high enough off of the ground so rats will not harbor beneath them.

Very often you can buy a farm with buildings already erected. As to whether or not it is profitable to do this depends upon the location and condition of the place, the arrangement of the buildings, and the kind of soil on which they are erected. Many times such a place can be purchased very reasonable, and by making slight alterations the buildings can be made to conform to the requirements for our Fool Proof Poultry Houses. These points all have a bearing upon your ultimate success or failure.

WASTED ENERGY

There is a lot of wasted energy on the average poultry farm, because poultry houses, yards, etc., are not properly located. Things are inconvenient, a great deal of unnecessary labor is required in order to do a small amount of work, and, as a result, little is accomplished in comparison to what is really necessary in order to succeed.

On a poultry farm of any size it is advisable to install a water system and pipe the water, or at least locate the water supply so that it will be as convenient to all poultry buildings and yards as possible and as your circumstances will permit.

In constructing poultry houses and equipment, it is well to keep these things in mind. Many farms have so arranged their places that it is not necessary to carry water, even where thousands of birds are raised and kept for laying or breeding purposes. Many have all the water piped right into the houses and it runs continuously, with an overflow pipe to take care of the waste should the receptacle become too full. In other cases they are arranged with an automatic cut-off.

It is vital that you give at least some consideration to the convenient arrangement of your houses, yards, water and feed supply. Cut your labor to the minimum.

STRAIN MORE IMPORTANT THAN VARIETY

There is no one best variety, but there is a great difference in strains or families. You should select a variety that suits your ideas as to color of egg, size of egg, size of fowl, shape of fowl, and color of plumage. Select a variety from which there will be a demand for hatching eggs and breeding stock as well as eggs and stock for market purposes. In other words, select a variety which has some virtue and which will commend itself to the buying public. Do not select some little, odd variety that you can breed only for fancy purposes and which has no utility value, especially if you expect to make a living from poultry farming.

Whatever you do, do not attempt to keep more than one variety of poultry. This is a rock upon which many flattering poultry ventures have been wrecked. It is a great mistake for the beginner or the average poultryman to attempt to raise more than one variety of poultry. It usually results in failure sooner or later.

After you have carefully selected and determined upon the variety which you wish to breed, stay with it, and do not be flopping around and jumping from one variety to another, but attempt to perfect your own. Use your best endeavor to get a good strain and good blood to begin with. Do not take the owner's word for it, but make inquiry for yourself. Whatever you do, use pure bred poultry of some variety.

VITALITY LIES AT THE FOUNDATION OF SUCCESS

At the very foundation of the successful breeding and raising of live stock of any kind, lies vitality. Especially is this true with poultry. The short time that the chick is in the embryonic stage; the quick growth which it makes; the comparative short life of the chicken; the immense amount of food which it consumes, digests and assimilates; and the strain of manufacturing and laying a sufficiently large number of eggs to make that chicken profitable, all tell upon the constitution of the fowl. Thus, unless the poultryman uses his very best breeding stock, uses good judgment in making his matings, and sees that vitality is coursing through every vein, he is certain to suffer more or less loss because of this neglect.

Do not use immature stock. Yearling hens, hens which have laid during one pullet year, are much better breeders than pullets that are from seven to fourteen months old. Many good poultrymen use their best hens until they are four years old. If you find an especially good breeder among either the males or females, you would make a serious mistake by disposing of that fowl at any reasonable price if you expect to stay in the poultry business.

One common fault which is found among poultrymen in all sections is their inability to distinguish high and low vitality, vigor and lack of vigor in fowls. They know when a chicken is near death's door if afflicted with some of the more common diseases, but if it is a fowl with a well marked plumage or a good shaped comb or one possessing some other characteristic which they especially admire, they too often overlook the long snakey head, the sunken eye, the thin breast, and other evidences of weakness and lack of vitality. It will pay any poultryman to give days of careful study when it comes to selecting the stock for his breeding pens. Mistakes here are costly. It means a season's work lost, to say the least, and you may never be able to recover from the effects of mistakes in breeding made in a single season.

A great many poultrymen make the mistake of buying eggs, stock or baby chicks promiscuously and do not know anything about the breeding back of them. No man can afford to take chances like that. It is simply a leap in the dark. You should know something about the breeding back of your stock, their former good health, their ability to produce a large number of eggs and to fertilize a reasonable per cent of them. Do not take the other fellow's word for this unless he guarantees to back his statements. Raise your own stock, at least the males that head your flock, or else find out something about the class of stock upon which you expect to base your hope of success or failure.

PREPOTENCY

There is no better method of testing the faculty of prepotency in any male or female than that which has been described in one of our lessons, the Call of the Hen. The real test, of course, is in the results obtained by actual breeding. But it will pay any poultryman to test his breeding stock by the above mentioned method. We believe that it is dependable, and if so, it will be a big factor in your success.

If you find a male or female which is able to transmit its desirable characteristics, such stock should be kept and used just as long as you can improve your flock by using that blood. Some desirable characteristics are dominant in one fowl and recessive in another. The same will be found to be true of undesirable characteristics. The careful breeder and the one who makes real progress in breeding prize winning birds and high laying strains are the ones who give this subject some thought, and who mate their birds accordingly.

To illustrate the recessive and dominant characteristics in certain animals, we quote you from a letter recently received relative to this point:

Holly, Colo., Sept. 6, 1915.

"Mr. E. M. Botsford was for seventeen years with G. W. Lilly's (Pawnee Bill's) Wild West Show. A greater part of that time he was superintendent of the show and had charge of the breeding of buffalo at Pawnee, Okla. He stated that his first experiment was with the breeding of a buffalo bull to a Polled Angus cow. The cow was taken very sick and became bloated at the end of the nine months period, but recovered and delivered the calf at the usual period for buffalo; i. e., eleven months. The heifer calf from this cross was of true buffalo shape, but the color was black as a Polled Angus. This heifer was bred at two years old to a buffalo bull and at nine months was delivered of a calf of true buffalo shape and color. From a number of experiments he found that native cows bred to buffalo bulls delivered calves at the eleven month period, but the cross bred calves when bred to a buffalo bull delivered in nine months in every instance, plainly showing the dominant and recessive qualities of these two animals. I consider the above authentic and thought it might interest you."

Yours truly,

FRANK FORBES.

From the above it will be seen that in the first cross, the shape is dominant and the color is recessive in the buffalo, and the shape is recessive and the color is dominant in the Polled Angus cow. The same peculiar dominant and recessive characteristics will be found in breeding poultry. Some of these add to one's success, others lead to failure. The thing to do is to give your breeding pens and the results more careful study and profit by the experience gained therefrom.

SELECTING EGG TYPE

Give some attention to the selection of the male and use males from high laying hens, and also use females that are bred from good layers. The same rule applies in trying to breed other desirable qualities into your flock. Use birds bred from birds in which the desired characteristics predominate.

In the varieties that have white ear-lobes, you will find that the best layers are those which have the clearest, whitest ear-lobes. Those which have white lobes that show a yellowish cast are not as good layers as those which have the pearl white lobes. Some are using this test in sorting and selecting their best layers, the yellow lobes indicating poor layers and the pure white lobes indicating good layers.

The best laying hens and pullets, which are representative of varieties having yellow legs and beaks, nearly always lay the color out of their legs and beaks. In other words, the best layers in such varieties have lighter colored legs and beaks than the poor layers of the same varieties, the poorest layers having the yellowest beaks and legs, as a rule. In selecting for egg type do not fail to always consider the facts as we have given them in a previous lesson:

"There is an egg type and a meat type in poultry, just as true as there is a dairy type and a beef type in cattle. We find both of these types in all varieties of poultry. And there is also the intermediate, or dual purpose type. We are not going to attempt to describe these except to say that our best hens are medium sized birds, and, as a rule, are under standard weight. They are late moulters and not so much inclined to broodiness. They have thin pelvic bones; rather high tails; rather narrow skulls, not a masculine head in appearance; large, bright eyes; large combs; long and broad backs, carried much higher at that portion nearest the tail; wide behind, with plenty of space between the point of their breast bone and the point of the pelvic bones; and they must be good feeders, always active and alert. The good laying hens are nearly always somewhat close feathered, not loosely feathered like the Cochins."

WHY HE HAS SUCCEEDED

The following advice is offered by a poultryman who annually ships thousands of dollars worth of hatching eggs, commercial eggs, breeding and exhibition stock. He uses business methods of squareness and fair dealing. He tells his own story and leaves no question as to why he has succeeded:

NEVER ARGUE WITH A CUSTOMER

"We have upward of one thousand customers every year and deal with persons with every possible sort of disposition, but we never have an argument with a customer. Life is too short and there are too many customers. If a customer thinks that he knows more than we do, we do not attempt to disabuse his mind. Ours is a busy life, we have plenty of work and correspondence, and before everything we want peace, and that only comes from satisfied customers. Claims or disputes over small or mis-shaped eggs do not amount to one-hundredth part of the claims about poor hatches. As we set a large number of our own eggs every week we know in a general way about the fertility of our eggs and when they are hatching well. Notwithstanding this we receive claims about every egg being infertile and about five per cent hatches. What has happened to the eggs after they leave us we do not know, but if the same eggs had been incubated at home, good hatches would have resulted.

DUPLICATE ORDER

"What is done in such cases? Just duplicate the shipment and give a suggestion or two about proper incubation methods and wish the customer a better hatch. Nine times out of ten they do get a better hatch and come back with an additional order. Had we argued the matter with them, a lot of time and energy would have been wasted, we would have attained their ill-will and in addition lost their trade and good word forever. The gist of the whole matter is just this, if a breeder will see to it that his hatching eggs are in good condition and will ship only such eggs as he sets for his own use, the total claims in an entire season will not be more than one per cent, and it does not pay to quarrel with any man or woman over such a small percentage.

SHIPPING ON APPROVAL

"Just so with shipping fowls on approval. They are sent with the privilege of return and money back if not fully satisfied, if the fowls are returned within 48 hours after arrival. In shipping out 500 fowls last fall and winter under this agreement, I can only remember of four shipments being returned. For some reason or another customers were not satisfied, though we considered we had sent them full value. On return of the birds a check was sent by first mail and the whole matter was dropped from our minds. Some times we catch a 'tartar,' who heap all kinds of abuse on us even before they give us a chance to return their money. It is always a temptation to tell any of this class what we think of them, but from our experience the best thing to do is to mail a check and cross the name from the mailing list, so as not to be bothered with them again.

ACCEPTS CANCELLATIONS

"If a customer wishes to cancel his order we accept the cancellation without quibbling. This last season there were only two such instances; a lady paid for 200 day old chicks, to be shipped during the season, two months later. Two weeks before the chicks were to be sent, she wrote asking the privilege of cancellation and the return of her money less any amount we wished to deduct for our trouble. She was going to be married and her plans had changed. Another party had sent 20 per cent as a deposit for 200 chicks, and three days before they were to be shipped telegraphed saying he could not send the balance. A letter of explanation followed stating that the failure of a firm in which he was interested had embarrassed him financially and he could not complete the payment. This party said we could keep the deposit. In the first case we returned the full amount and wished the lady much happiness; in the second case, chicks for the amount of the deposit were sent on and the order for the rest cancelled.

"We do not know of any place where it pays more to give customers a square deal, or a little more than a square deal, than in the poultry business. A large percentage of our business is in repeat orders and we increase our business 50 per cent or more each year, without increasing advertising. That is the dividend paid by treating customers liberally.

"Of course we are imposed on occasionally, but we do not let that worry us. The result at the end of the year is what we are after and if at the close of the season the claims and cancellations have not been too much for the volume of business, we are well satisfied with our policy."

IS IT BETTER TO BUY OR GROW YOUR OWN POULTRY FOOD?

This is a question that is often debated, but there is really not much room for argument where poultry raising is the chief business of the farm. On the general farm, where poultry raising is a side line, and where grain growing is one of the chief parts of the farm operation, it will pay to use some of your own grain for your poultry. But on a strictly egg farm or an almost exclusive poultry farm, it does not pay to attempt to grow your own grain foods. You can buy them from people who make a business of producing grains or from some large dealer, who handles feeds on a small margin of profit, much cheaper than you can produce your own feed. Your time is more valuable and should be devoted entirely to your poultry, if you are expecting to make money from an exclusive poultry farm. You can buy most of the foods cheaper than you can grow them. The farmer in the corn belt and wheat growing sections can employ men at 75c to $1.50 per day to compete with you in growing grains. Your time is worth several times that when devoted to your poultry. Every poultryman should try to grow his own green food. That will not require much land or much labor. Then you always have fresh, succulent, green food for your fowls. Outside of raising the necessary green food, your time can be more profitably spent if it is devoted to looking after the details, and trying to provide for the comfort of your chicks and fowls, and endeavoring to discover the leaks and means of increasing your business and your profits. So we advise against attempting to raise your own poultry foods, as a rule. You can save money by buying a reliable feed already mixed.

But when feed is extremely high in price it will pay you to grow more food than is ordinarily done. If you can grow an abundant crop of any sort of grain or green food without too much labor and expense and without utilizing space that is really needed for your poultry, this should be done when feed is high. If you have a patch of ground that is suitable to corn growing, it should be planted to corn and the chickens allowed to range in same after it has gotten well started. If you can grow some Mangel Beets, Rape, Swiss Chard, Clover, Oats, or some other grain or green food that will not require too much labor and which will give you an abundant yield, you can cut down the cost of feeding your poultry very materially. Then you can buy your ground feed for mash and the bulk of your grain on the market.

If yourself and a number of other poultrymen in your community will form a club and order feed in car lots, or at least in several ton lots, you can usually get your feed at the minimum price by so doing. It does not pay to waste your time growing or mixing feed.

MISTAKES IN FEEDING

The poultryman who watches the prices of the various ingredients which go to make up his feeding ration shows signs of wisdom. Very often corn and wheat and other staple foods can be bought cheaper at harvest time, or be contracted for from some reliable milling company or feeding concern than at other times. The item of feed is one of the biggest things in the poultry business and it often pays to be on the lookout for bargains in anything in that line.

When a certain kind of grain increases in price, because of scarcity of demand, to such an extent that a poultryman cannot afford to feed it, he should try to find some cheaper food that would make a good substitute, something which could be used without influencing the egg yield or affecting the health of the fowls. It pays to be very careful in making substitutions, and it should be done gradually. Any sudden change in feed will affect the egg yield, also hinder the growth of young stock for a short time, and often cause digestive disorder. Two foods may be practically the same in chemical analysis, yet the fowls may like the one and dislike the other. One may give splendid results, and the other prove very unsatisfactory, as is the case with wheat and rye.

Wheat and corn should always constitute a good portion of the grain food. The results obtained with a wheat and corn ration are so much better than with most grains that can be substituted for them that it seldom pays to discard these two grains entirely from the ration, even though the price is high. By making the grain ration one-fourth wheat and one-fourth corn, the other half can be composed of cheaper grains if such can be secured, such as barley, kaffir corn, milo, oats, buckwheat or other grains of like feeding value. It is difficult to find anything which will entirely act as a substitute for wheat and corn.

It is results that you are after, growth in the young stock, eggs from the layers, fertility and hatchability with the breeding stock, and health and vitality with all of them, and if you can get these with foods which you can substitute there can be no objection to such substitutions. The same applies to the dry mash and all other foods used. This is a thing which receives much consideration on the part of the successful poultryman. It is a big factor in the profit or loss of any farm. On account of the cheapest and most plentiful feeds varying so in different sections, it is difficult to recommend any one best thing which would be suited alike to every section.

Please bear in mind that you cannot do your feeding absolutely by rule. Some seasons more will be required than others. Some pens of fowls will require more than others. There is a possibility of a ration being balanced and still not being as palatable or digestible as it should be for best results. The poultryman who enters his house with a bucketful of feed and two buckets full of gumption is the one who gets best results.

A grain may be inferior in quality, but it should be pure and wholesome, free from decay, must and mold. The same should be said of all other foods. One very often finds a poor grade of dry beef scraps. Much of that which is sold on the market is inferior in quality and has a very objectionable odor which should condemn it. A very good way to test beef scraps is to put some in a cup and pour a small quantity of hot water over it, just enough to cover the beef scraps well. Stir it vigorously. If it has a bad odor, or if it foams and appears to be soapy, it is an inferior grade which should not be used. It is best to examine all your feed carefully, especially if you are purchasing a large quantity. Poultry foods may be inferior of quality, but should be pure and wholesome.

Never feed foods which are so wet that they are sloppy. This practice often causes diarrhea. But it is advisable to use moistened mashes with both the young stock and the laying hens.

The drinking pan must never be allowed to go dry, winter or summer. Water is very cheap, but it constitutes a large part of the egg and a larger part of the weight of a hen's body. It is very essential to health and to egg production. If hens are allowed to suffer for water, it will cause a big decrease in the egg yield and a big slump in the profits.

Feed your flocks in such a way that they will not be compelled to eat in their own filth. Cleanliness in feeding is important. Feed on fresh soil, a clean floor or board, or in clean litter. Never throw a moistened mash on filthy soil, in a dirty litter, or on a floor or board where there is great danger of the fowls becoming contaminated by disease germs. We once visited a large eastern poultry plant, where the feed man simply took his foot and scraped away the filthy litter from a dirty floor, and then threw the moistened mash upon the filthy floor. In the scramble to get it, the dirt and litter were mixed with the mash, and this farm was losing hundreds of hens with tuberculosis and various kinds of diseases, and finally failed.

Always bear in mind that for best results there should be a difference in the methods of feeding the breeding stock and the laying hens. The breeding stock require less feed, less beef scraps, less fattening food, more green food and more exercise. By right and sensible methods of feeding and by the practice of economy a big increase in the profits of any farm is made possible.

A SECRET IN FEEDING YOUNG CHICKS

In growing young stock it is very important that they be kept growing and at no time are allowed to become stunted for any reason whatever. They should be kept on fresh soil each season. If you are forced to use the same pens every year for the growing stock, see that the soil is made fresh and sweetened by cultivation and by growing some green food thereon.

There is one method of feeding chicks which should be practiced by every poultryman whose young stock is kept in limited quarters. If the chicks have free range and find plenty of bugs and worms, it is not so important. But unless this is true, poultrymen can grow much better chicks, they keep in better health, and they develop faster where this feed is used in addition to their regular ration.

The feed is mixed as follows:

2 quarts bran.
1 quart shorts or middlings.
1 quart corn meal.

This is mixed as a dry mash. A large quantity of it can be mixed for a large flock, but it should be mixed in the above proportion. It can be mixed and stored in bins, sacks or hoppers and used just as needed.

Six quarts of the above mash are used in preparing this feed. With this is mixed one quart of ground lean meat. Any kind of cheap lean meat will answer for this purpose. It must not be tainted in any way. The one quart of meat and the six quarts of mash are thoroughly mixed. Then one pint to one quart of water is added. This mixture is thoroughly stirred until it is well mixed, after which it is run through a sausage mill or any other kind of mill that will produce similar results. The meat will be mixed with just enough of the mash that the chicks do not overeat and the results are surprisingly good. It will tend to keep the birds in good health, it will hasten their growth and add to their vigor. This is a cure for many ills in raising young stock.

Do not give all the birds will eat, although there is not much danger of causing serious trouble because of the amount of dry mash mixed with the meat scraps. You will find this a great aid in raising young stock and securing a satisfactory growth and development. It is worth a great deal to know this one secret. One prominent poultryman said this one fact was worth a trip across the continent to learn of it. Especially is this recommended for young chicks that have reached the age of a month or more.

BUYING CHICKS FROM HATCHERIES

You should be very careful in buying baby chicks from public hatcheries. In the first place, they are seldom as careful as they should be in buying their eggs from well bred poultry. If you are going to use high priced labor on poorly bred poultry, you are going to suffer unnecessary loss. You ought to know something about the breeding of the stock which you propose to raise.

Then there is great danger in spreading disease by buying from hatcheries. They are often not as careful with their machines as they should be, and many diseases are spread in this way. Especially has this been true with White Diarrhea. Unless you know the management of a hatchery to be perfectly reliable, and know the stock from which your chicks were hatched, be very careful about patronizing it.

CUSTOM HATCHING PROFITABLE

A good hatchery, which can be centrally located in a good poultry community, can do well and make money for the owner if it is properly operated. You can charge a reasonable price for hatching eggs for people who wish to have their own eggs incubated. You can also sell day old chicks from your machines. In this case, it pays to buy eggs from reliable and dependable stock and to so advertise. It is easy to build up a profitable business by selling chicks that will develop and give satisfaction in the hands of your customers. If your chicks become known for their quality you can sell them at an increase in price over the general run of chicks. There is a great opportunity for a profitable business along this line to be built up in every community where there are many poultrymen. A hatchery with a capacity of from 2,000 to 5,000 chicks per day is not uncommon. Mammoth incubators are used for this purpose.

The price charged by some hatcheries for baby chicks is as low as seven and a half cents per chick where the customer calls for them. Many get as much as fifteen to twenty-five cents each in hundred lots for a good grade of stock. Some fanciers charge as much as fifty cents to $1.00 per chick.

BROOD LARGE NUMBERS

If you are going to make a living from the poultry business, it is necessary to plan to save labor in every possible way. Every step saved will give you just that much more time to look after some detail or enable you to care for just that many more head of stock.

The above being true, we advise the use of some method of brooding so that you can brood as many chicks as possible without being compelled to fuss around with a lot of little flocks. There are systems of brooding that are very satisfactory, and which will enable you to keep from 250 to 1,000 in one brooder or one room. If they can be grown successfully in such brooders, you can do all the cleaning and all the feeding and watering without being compelled to make many different trips to many houses or hovers. If you only desire to raise a few chicks, there are many small brooders that give most excellent satisfaction. These large or small brooders and hovers can be bought from many different incubator and brooder manufacturers who are continually trying to improve the system used in the past, and very rapid progress is being made in this respect. If you need advice in this line we will be glad to assist you if possible.

HOW TO PREVENT CHICKS FROM PICKING AND INJURING ONE ANOTHER

Where chicks are raised artificially, especially where 250 to 1,000 are kept in one room or brooder, they often become very canabalistic. They develop the habit of picking at one another's toes until they make them bleed; or they get into the habit of picking at the end of the wing or at the vent of another chicken until they practically eat the unfortunate chicken up. When once started the chickens quickly develop the habit until the entire flock is busy at such mischief.

This can be prevented by keeping the little fellows busy. Those which run out-of-doors do not seem to develop the habit. We advise painting the windows of the brooder house with whitewash, and we sometimes use some bluing in it to deaden the light. If you will not allow the direct rays of the sun in your brooder house, and deaden the light, you will practically eliminate all future trouble along this line.

We also tie a piece of meat to a string and put it just high enough from the floor so the chicks have to jump a trifle to reach it. The vigorous chicks keep busy at this and do not find time to bother the weaker ones. The blue or deadened light in the brooder house will practically solve the problem. Paint your windows with a bluish whitewash, or powdered French chalk, whiting, or Bon Ami.

INTENSIVE OR NOT INTENSIVE

The question of how intensive your farm may be depends largely upon your soil and the climatic conditions. We have seen single acre tracts in sections of California where from 1,000 to 3,000 laying hens were kept year in and year out. We are of the opinion, however, that this number of chickens is too many even in the most favorable sections of California. Serious trouble is almost certain to come sooner or later to those who overdo the thing.

Where this number of hens is kept, the soil must be sandy and porous. The climate must be dry and the temperature moderate. A large number of hens cannot be kept on a small piece of ground in any state where the land is inclined to be cold and damp, or has a tendency to become sour. If you will bear this fact in mind, it may save you from failure.

If you do not expect to raise or breed your own stock, but expect to buy your mature pullets from the outside and simply replenish a portion of your stock in that way each year, you can keep many more laying hens on the farm than you otherwise could. If you expect to raise your own stock from which you intend to breed, then they need range and fresh soil. If you simply expect to buy several thousand baby chicks each year, raise those and keep the pullets only for layers and not for breeding purposes, then these do not need so much range. Under these circumstances, you can raise several hundred on a very small plot of ground. Remember that the plan of your houses and yards, the soil, and the climate are the things which you must consider before you can begin to succeed on a very intensive farm.

Several hundred laying hens and pullets can be kept in one house and on one small plot of ground where they are used only for laying stock. Many poultrymen confine them to the house from one year to the next. In that case it is a good idea to have a two story house with a dirt floor below, or at least have a small yard in front so the hens can get into the sun and scratch in the soil. Laying hens do not need much range or require much space if the soil, houses and climatic conditions are right.

CO-OPERATIVE ASSOCIATIONS OR FEDERATIONS MAY MEAN THE SOLUTION OF POULTRY PROBLEMS

The formation of poultry communities which bind themselves into co-operative associations or federations may mean, and we believe will mean, the solution of many poultry problems.

Very often with one man fighting his battles alone, he cannot secure the markets, he cannot get the prices he deserves, he cannot produce volume enough to make his business worth paying a premium on, he has to pay the highest prices for his supplies and feed, and he is deprived of many things which he might have if he were operating through a co-operative association in a poultry community.

If there are a number of poultrymen operating through the same organization and living in the same community, some could make a specialty of hatching chicks for the entire community, This would enable the work to be done by experts, and the cost and loss reduced to a minimum. It would save a lot in equipment and a lot in expense of operation. It would enable the poultryman to have his own eggs hatched or to buy his baby chicks, and devote all his time and equipment to raising them. Others might become specialists in raising and selling pullets, and still others might become specialists in trap-nesting and breeding for egg production, and in raising and selling stock for that purpose.

Through such organizations fencing, lumber, feed, equipment and supplies can be bought in car lots and a great saving in freights and prices can be made. Then when it comes to marketing, there is volume of business enough to justify the best buyers to solicit your business and pay you the very best prices for your products. Just that difference: the two or three cents saved on feed and supplies, and the two or three cents increase in the price received for eggs and poultry, is just the difference between success and failure in thousands of cases. Therefore, we encourage the forming of poultry communities, and the organization of poultry co-operative associations and federations. We believe this will be the solution of many poultry problems, and will be the means of hundreds succeeding where they now fail.

NO GREAT INCOME WITHOUT VOLUME

It is a mistaken idea that you can buy or raise a few or even a lot of chickens, and then all you have to do is to go out and gather in the eggs and consequently the money. They must be fed and cared for, and both feed and labor are high priced.

It is also a mistaken idea for the average man to think that he can make money from a few chickens. There are some fanciers who succeed in obtaining high prices for stock and eggs which they have for sale, and they do quite well and make money from a small flock. But the average man who expects to make money from a flock of laying hens, and depends largely upon the sale of table eggs and market poultry for his income, must have as many as 1,000 hens and pullets, in our opinion, before he can do much. Unless he has sufficient capital to keep 1,000 hens, he had better use his poultry as a side line, and depend upon some other business for a part of his support. You cannot have a very great income unless you have eggs and poultry for sale, and you cannot have the eggs unless you have the hens to lay them. In order to have volume of business so as to make it really worth while you must have laying capacity. Without the hens you cannot get the eggs. With the right system, the right equipment, and any sort of help from his family, one man can care for from 1,000 to 4,000 hens and raise the pullets to replace the old hens. It is easier to make $1,500 from 1,000 hens than it is to make $4,000 from 4,000 hens. By increasing your numbers and your capacity, you increase your volume, but you also increase the cost of operation, you cannot give so much attention to details, and you decrease the per cent of net profit per hen. While this is true, you must bear in mind that you must have eggs to sell if you are to have any income, and if the number of hens which you keep is so small that it takes all of your income to pay living expenses, feed bills and cost of operation, you have no chance to increase your income and you have nothing to offset the depreciation of your buildings and equipment.

About the best any poultryman can hope to get is an average production of 50 per cent and there is not one in a thousand who does so well as that; the average is perhaps nearer 33 1-3 per cent per hen or even less. If that be true, you can readily see that a poultryman must have quite a number of hens, if he is to have much of an income. If you cannot start with a reasonable number of hens, then depend on something else for a portion of your income until such a time when you will be justified in devoting all your time to the poultry business. By all means keep pure bred poultry, and sell stock, eggs and baby chicks for breeding purposes. These will add to the income.

ENEMIES AND DISEASES

A final and an important thought which we would like to leave with you as far as enemies and diseases are concerned is that there is more in prevention than there is in cure. When poultry is kept in large numbers it is wise to use any remedy that can be effectively used as a flock treatment. But, as a rule, only in cases where the bird is a very valuable individual can you afford to give individual treatment. In every case, if birds exhibit evidences of contagious diseases or serious sickness of any nature, it is wise to separate such fowls from the general flock and place them in quarantine.

Inasmuch as prevention is far better than cure, it behooves every poultryman to give serious thought to methods of prevention. See that the houses are dry and free from drafts; see that the premises are sanitary; see that the yards are well drained; see that the soil is sweet and pure; that the feed is wholesome; that the stock is kept free from vermin; that the breeding stock is mature, vigorous and healthy; that the brooders and incubators are properly operated so as to be conducive to health and growth in the young stock. Such thought and such methods on the part of the poultryman as will lead to the proper consideration of the above things will go a long way toward success in any case, and will do more good and be more effective than all the dope and medicines in christendom. We beg of you to look to the future in planning your poultry work, and the proper consideration of these problems in advance will often steer you clear of the rocks upon which many poultry plants have been wrecked.

THE MARKETS

It so often happens that a man is successful in producing eggs in large numbers at small cost. He often has no trouble to hatch and rear chickens successfully and economically, but he fails when it comes to marketing his product. This is sometimes due to the fact that the man is a poor salesman. It is well to study salesmanship. Failure in securing profitable prices is often due to the fact that the poultryman selected a poor location for his farm. He is out of reach and out of touch with the best markets. It profits but little to be able to produce eggs and poultry in large numbers and be able to do so economically, if you are then unable to dispose of them at a price which makes it profitable.

In locating, investigate as to the markets and prices. Here again is where the co-operative producing associations and poultry communities are of great advantage to the individul producer.

HOW TO PASS THE STAGE OF FAILURE

A good many poultrymen start out with limited capital, and, of course, nearly always make a great many mistakes in the beginning. Just at the time when they get right up to the point where they really know the business, where they are in a position to begin to reap a harvest and where they have worked up a business and a reputation for themselves, their capital has given out and they haven't sufficient income so that they can hold on and tide over this time.

Then again a poultryman will invest his limited capital, and he will not take into consideration the fact that his stock has to be fed, and perhaps hatched and fed and grown during a period when he will be having very few sales and very little income. For that reason he is not able to hold on to his growing stock and mature the birds to an age where they can be sold profitably for breeding purposes, or carry over a sufficient number of his birds to the breeding season when he can expect quite an income from hatching eggs. For that reason he is forced to sell off many birds that really should be kept for breeding purposes or for the purpose of producing commercial eggs.

It is often hard to get past the unproductive seasons. If you have plenty of capital this is of no concern to you; if not, the only resort is to save enough during the productive season to pay expenses during the unproductive one, or else so plan your work and labor on the farm as to have an income from some source during the period when your poultry cannot be depended upon for an income. Provide for a rainy day and make your plans so as to protect yourself against a dull time that might come. A precaution of this sort may lead to success that may have otherwise resulted in failure.

YOU WILL MAKE MISTAKES

You will make mistakes. That is to be expected. You will suffer loss at times. If you do not, you are the one exception in life. Do not expect everything to be happiness and sunshine. Disappointments come to the most successful business men. All their plans do not materialize just as they expected them. Some of the best educated and best trained experts in all lines of business fail. More than 95 per cent of the men in all lines of business fail at some period in life.

Thus it is not to be expected that every man who engages in the poultry business will succeed. Perhaps only a small per cent of them will. But we have endeavored to advocate only safe and sane practices, and to point the way to success if the outside conditions are normal. As to the remainder of the problems which confront our students while engaged in the actual operation of their farms, we can only advise them by personal letter, which we will be only too glad to do at any time. We will also keep in touch with all the latest developments and experiments made by individuals, government and state experiment stations, and upon our own experimental farm, and our students will be informed of these facts from time to time by circulars, letters and by other methods even though they have completed their course and passed satisfactory examinations on each lesson.

CONCENTRATION! APPLICATION!! WORK!!!

In recommending this course to his friends, Dr. P. T. Woods offered some advice which is so valuable that we repeat it here.

"Whether you get much or little out of it will depend largely upon yourself and the sincerity of the effort you put into it. Try it, but make a real business of it, not simply a pastime. Be sure that you put real work into it and do not side-step your opportunities. Do not imagine that securing a diploma is the goal you are striving for. The diploma is meaningless unless you have, by diligent study and practical application, built within yourself a substantial foundation for future work out of the lessons the course provides.

"Study, well-chosen reading, all efforts to improve one's self—to prepare for the opportunities which may come—are always worth while. Abraham Lincoln said: 'I will study and get ready, and maybe my chance will come.' The chance always comes if you get ready for it. Dean I. T. Talbot, a leading educator in his day, always addressed the entering classes at the university on the importance of putting whole-souled effort into study and into practical application of the lessons. At impressive points in his discourse he would thunder out, in a voice that vibrated to the innermost depths of his students, his favorite slogan, 'Your success depends upon three things—*Concentration! Application!! Work!!!*' The first time we heard it, it merely startled and provoked a smile. The second time it began to convey a meaning. With each repetition the meaning became more plain and the conviction grew that in those three words, so forcibly expressed, lies the real secret of all success in life. With that simple 'call to arms' in the workaday world, Dean Talbot, by the magic of his personality, changed many a heedless boy or girl into a thougtful man or woman and helped them to get a firm foothold on the first rung of the ladder of success.

"Do we consider a correspondence course in poultry husbandry practical and worth while? We do. Its value to you, friend reader, will be worth just as much as you make it worth by 'Concentration Application!! Work!!!' Get ready! Your chance will come!"

NOW FOR SUCCESS

This is the concluding lesson of this course. While this is true, it is just the beginning of the practical and helpful lessons which we expect you to learn as one of our students. We do not mean to be egotistical when we say that we believe you have been given more practical and down-to-date information in this course than you will find in any other poultry literature or through any other correspondence school. It is up to you to now put your knowledge of the business into actual practice, and as you meet obstacles from time to time, we desire and expect you to call upon us for help. We will always be glad of the opportunity to write you personal letters, and to explain problems in detail and give you the advantage of the very latest and best information which we can gather by investigation, experimentation and observation.

We have only one favor to ask at your hands and we expect to be granted that right and that pleasure, which is to the effect that if there is any thing connected with this course in Poultry Husbandry with which you are not satisfied, if there is something which has not been made plain to you, we want you to give us the opportunity to stay with you until we have at least demonstrated the fact that we have wanted and tried to do our full duty to you in every respect. If we have fallen short of our duty, if we have not tried to give you value received, if you need more information on any subject, we are your servants at all times in the future and expect to make good on any proposition if such is possible.

In our great universities, graduation day is called "Commencement," which means that though the students have completed their courses as far as that school is concerned, yet it is just the beginning of the time when they are to really put into practice and profit from the valuable lessons which they have learned while in that school. It is just the beginning of life and they are now to apply and profit by the foundation which has been laid for them. It is just so with this course. Do not judge the good which is to come from your relations with us as one of our students by only the things which you have thus far learned and the experiences which you have thus far had, but look upon this as the foundation stone upon which you must build if you are to meet with success as a poultryman, either on a large or a small scale. We shall ever be interested in your success. We fully realize that the success of our students means our success. We do not want you to feel that your relations with us or that our obligation to you is at an end. You are now expected to engage in the business to any degree that you see fit, and we expect to work along together, we expect to be informed of your problems and difficulties and to work out our successes and future together. Feel free to call upon us for advice and help.

There are no examination questions with this lecture, therefore the student is not required to pass an examination on Lecture Number 38.